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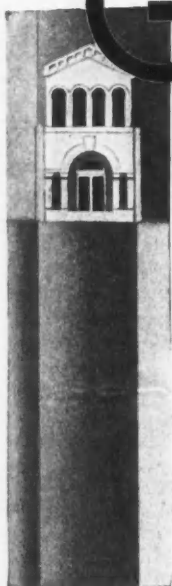
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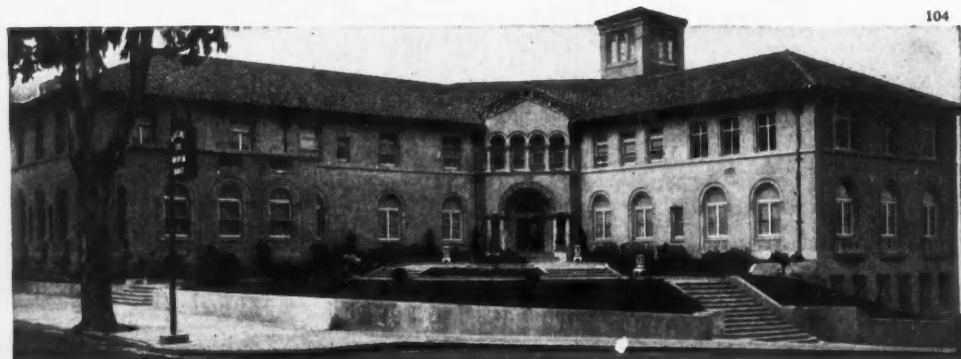
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No. 1

TRANSURETHRAL PROSTATIC RESECTION*

A GENERAL ESTIMATE AND A SPECIAL STUDY
OF TWENTY PHYSICIAN-PATIENTS

By GERSHOM J. THOMPSON, M. D.
Rochester, Minnesota

DISCUSSION by J. C. Negley, M. D., Los Angeles; Robert F. Day, M. D., Los Angeles; Wiley B. Wesson, M. D., San Francisco.

TRANSURETHRAL prostatic resection has withstood the test of time. It is no longer in the experimental stage of development; in fact it has long since displaced prostatectomy except in an occasional case.

Within the last two years, I have performed the operation in more than two hundred cases, and have been intimately concerned with the post-operative care and results in at least as many more in which the resection was performed by my associates in the Section on Urology at The Mayo Clinic. Therefore, I can relate unlimited details of these cases in proof of my contentions, but must, for the sake of brevity, make categorical statements which will be subject to doubt. The opening statement stamps me as an enthusiast, and many conservative physicians will probably smile forgivingly and murmur, "Just wait a while." Nevertheless, I shall still be enthusiastic, for only through such an attitude can an ultra-conservative tendency be somewhat counteracted.

RECENT EXPERIENCES

Each week I see patients who have been told that this procedure has been condemned and abandoned by the medical profession. Fortunately news, both good and bad, spreads rapidly, and the results of prostatectomy for years have made laymen none too happy when a member of the family has become afflicted with prostatic disease; similarly a neighbor's quick restoration to health following transurethral resection has often helped to overcome criticism of the procedure by an uninformed physician. Despite warnings, many old men have visited the clinic in the last year demanding a punch operation and refusing to sub-

mit to anything else, thus forcing extension of the method to include resection in cases of even the most extensive prostatic hypertrophy. Strange to say, a similar attitude has developed in the minds of afflicted physicians, as is evident from the records of The Mayo Clinic for 1932, when twenty physicians underwent transurethral resection. The large majority stated specifically that they wanted that operation and none other; the others hoped fervently that it would be applicable, and it was applicable, without exception. From 1925 to 1931, fifty-five physicians, or an average of seven and eight-tenths a year, underwent prostatectomy at the clinic. The proportion of physicians to the total number of patients treated surgically increased from 3 per cent, during the years of prostatectomy, to 7.2 per cent, now that transurethral resection is being employed. There is no doubt in my mind that any physician who is familiar with the literature or, better still, who has witnessed the operation and postoperative course of patients who have submitted to transurethral resection at the hands of competent surgeons, would choose the transurethral operation for himself, without the slightest hesitation.

CRITICISMS OF THE OPERATION

Critics of this operation say that it is a dangerous and unsurgical procedure; unsurgical because a large mass of tissue is removed by morcellation through an opening not sufficiently large to allow visualization of the entire field of operation at one time, and dangerous because control of hemorrhage is inadequate and urinary extravasation frequently occurs. Less bitter opponents of the procedure concede its virtues in dealing with the small cicatricial type of prostate gland, with median bars, and possibly in cases in which little hypertrophy of the lateral lobe exists. Some authors who advocate the operation still insist that careful selection of cases is necessary, but fail to give a definite method of selection, or description of the types of glands which they think suitable for resection. Others are of the opinion that it is an operation which will find its future as a prophylactic measure against subsequent prostatic hypertrophy in cases in which obstructive urinary symptoms are beginning. I shall not argue against these various statements, but shall merely call attention to the fact that most of the critics betray themselves by conceding that the method is ap-

* From the Section on Urology, The Mayo Clinic, Rochester, Minnesota.

* Read before the Urology Section of the California Medical Association, at the sixty-second annual session, Del Monte, April 24-27, 1933.

plicable in cases in which even hypertrophy is advanced if the patients constitute poor surgical risks. If the operation is applicable in such a case, then why should it not be applicable to the patient with extensive prostatic hypertrophy who otherwise is in excellent physical condition? From my experience I unhesitatingly say that the method is applicable, and is the one of choice in any case in which a resectoscope can be passed.

Patients with the most extensive hypertrophy can thus be treated. In the last eight months only two patients have been seen at the clinic for whom, because it was impossible to introduce the instrument, prostatectomy was performed. The operation can be performed with relative safety on the patient who is in extremely poor general condition. Patients with heart-block, angina pectoris, severe coronary sclerosis, diabetes, cirrhosis of the liver, asthma, extensive carcinoma of the prostate gland with metastasis, marked obesity, and severe renal injury with values for urea as high as 381 milligrams, were subjected to transurethral resection in the last year. Thus, many men who had been condemned to drain their urine by catheter, or to have a permanent suprapubic stoma for periods up to seven years, were again made able to void freely.

PHYSICIANS WHO WERE TREATED IN 1932

Twenty physicians submitted to transurethral resection in 1932 and their cases were carefully studied. None of these operations was done as a prophylactic measure for early obstruction, or because of few symptoms; physicians are unwilling to submit to an operation if it can be safely avoided. Since prostatectomy was not done during the year on a physician, it can be seen that there was no selection of cases. The youngest physician was fifty-two years of age and the average age was sixty-two and seven-tenths years.

The patients had suffered from obstructive symptoms of the urinary tract for an average of four and a half years, some for as long as twenty years. Sixty per cent gave histories of attacks of complete urinary retention requiring catheterization for relief, whereas others admitted that their obstructive symptoms had become so alarming that they never went far from the office without carrying a catheter. The prostate gland would be graded as large in all but three cases, in one of which complete urinary obstruction was present and the patient was wearing a suprapubic drainage tube, despite the fact that the gland was small. All of the patients had residual urine, the majority of them more than three ounces (90 cubic centimeters) and 25 per cent had complete retention. It would seem, therefore, that this was an average representative group of cases by which to test the merits of the operation.

ANATOMICAL INDICATIONS

Since the prostate glands were rather large, they represented the safest type, in my opinion, on which to operate. It might seem at first thought that the smallest glands would be most suitable, but I do not believe that this is true. The wall of the bladder of the patient with early prostatic

hypertrophy is usually thin, and there is no thickening of the trigone such as is seen in more advanced obstructive disease. Hence, a deeper incision than was intended might result in perforation into the perivesical or periurethral tissues, or possibly into the rectum. After a moderately long period of prostatic obstruction the wall of the bladder practically always thickens, and this thickening is usually accompanied by trigonal hypertrophy, as well as by subtrigonal prostatic hyperplasia. Consequently, it is possible to resect much deeper than is actually necessary without harm. Therefore, the inexperienced surgeon might well select for this operation the case in which enlargement is moderate, and carefully consider the risk in cases in which hypertrophy occurs early, and in which few obstructive symptoms are present.

A careful study of bladders removed at necropsy from patients dying of other causes convinces me that if one resects in the area necessary to relieve the obstruction, there is in any case of actual prostatic hypertrophy a good margin of safety. One need not fear the possibility of urinary extravasation if perfect visualization is obtained, and if one has had sufficient experience to be familiar with the topography of the neck of the bladder.

PROCEDURE WHICH WAS USED

In preparing the twenty physicians for operation, it was necessary to perform preliminary cystostomy in one because of severe cystitis and pyelonephritis, the urine being very purulent. Another physician came with cystostomy already performed. In similar cases in which it is felt that drainage of the bladder preliminary to operation on the prostate gland will be necessary for an extraordinarily long period, we do not hesitate to make a suprapubic stoma. This was done in fifty-two (18.8 per cent) of the 276 cases in which prostatic resection was performed in 1932. Five of the physicians who had been using catheters on themselves intermittently were permitted to continue that practice for a few days until roentgenograms and examinations of the blood could be made. Fortunately, fever or other evidence of infection from the catheter did not develop in any case. The benefit of the so-called vaccination produced by such reactions has been overestimated; logically, such infection should be harmful. Thirteen of the physicians had no preliminary drainage by catheter other than that necessary to establish the fact that residual urine was present. Thus, 65 per cent of them had no preparation other than the forcing of fluids a day or two prior to operation, and the usual preoperative enemas and medication. This is an even greater percentage than in the entire group of 276 patients on whom operation was performed during the year, 124 of which operations (44.9 per cent) were done following a similar regimen.

It is natural, I suppose, that a physician should want to choose the anesthetic employed on himself. For that reason a few were given nitrous oxid and a few sacral block anesthesia. I prefer spinal anesthesia, never using more than 100 milligrams of procain, and often as little as 50

milligrams, injected between the third and fourth lumbar vertebrae. Infiltration of the prostate gland is impractical and hardly merits mention.

Following administration of the anesthetic, the resectoscope should be introduced with little trauma, and the type of obstruction determined. The choice of instrument is a personal matter and of secondary importance to the ability of the surgeon to remove the obstructing tissue. Some men prefer direct vision instruments. Luys³ stated: "I cannot too much insist upon the fact that direct vision cystoscopy is preferable to every other, for it alone permits any therapeutic action to be direct and harmonious without any intermediary." Needless to say, most of the advocates of lens instruments do not agree with this, nor should they, if they cannot use direct vision instruments. The knife punch with multiple needle electrode, which is commonly employed at The Mayo Clinic, has been previously described by Bumpus,^{1,4} whose efforts have stimulated the suggestions of various workers in the Section on Urology, and have led to the development of the present improved form of instrument.⁴ At the Clinic most types of the various resectoscopes are available, and they have been used in more than fifty cases; but the use of the knife punch is preferred, for it can be used in spite of profuse bleeding, thus making it possible to remove a considerable amount of tissue in a minimal time.

All of the intravesical projecting tissue should first be excised, for it is almost always the principal cause of the obstruction. This is done as shown in Figures 1 and 2. The anterior half of the trigone can be safely cut away, and the portions of the lateral lobes which protrude intravesically should be excised, so that the floor and lateral walls of the bladder are flush with the prostatic urethra, leaving no projecting nodules in the region of the internal sphincter. The veru-

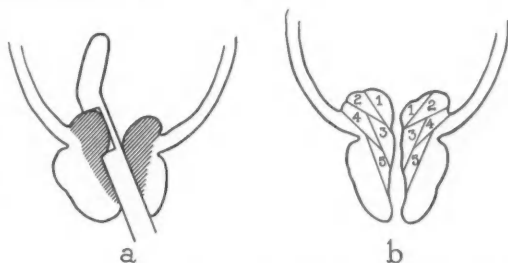


Fig. 2. a. Engaging an intravesical portion of the tissue; b, order in which pieces of tissue are removed.

montanum and ureteral meatus and ridge are the landmarks which guide the surgeon. If he incises within a region confined between their positions, he will not, in the ordinary case, get into difficulty. I wish particularly to emphasize that the removal of all of the intravesical tissue, particularly any remnants on the posterior vesical lip, is most important. The amount of intra-urethral tissue it is necessary to resect varies according to the type of enlargement. A good channel through the prostatic urethra will suffice; in fact it is inadvisable to resect as widely as possible. My opinion in this is similar to that of Caulk, who stated:² "The importance of urethral encroachment, except in the rare instances of intra-urethral lobules, valves or scars, is greatly magnified in the rôle it plays in obstruction."

The average weight of the tissue removed from the twenty physicians was 10.7 grams, and from one a total of 41 grams was resected. Microscopic examination of the removed tissue revealed adenofibromatous hyperplasia in all but four cases; one of these gave evidence of carcinoma, while in the other three the tissue was inflammatory.

POSTOPERATIVE CARE

When the operation is completed, a No. 24 soft rubber catheter should be fastened in the urethra, and through it the bladder must be irrigated often enough to prevent formation of blood-clots. When all venous oozing has stopped, irrigation twice a day will be sufficient. It is my practice to remove the catheter at the end of forty-eight hours. In the large majority of cases there will be no trouble in voiding; catheterization six hours after removal of the inlying catheter, fifty-four hours postoperatively, usually discloses no residual urine. If, however, more than five ounces (150 cubic centimeters) of urine is retained in the bladder, and obstructive symptoms persist, careful intermittent catheterization, or reinsertion of a retention catheter, will forestall the fever and toxemia which might otherwise result. If difficulty in voiding persists, a second operation usually is done within seven to ten days. This was necessary in 10 per cent of the group of physicians; 90 per cent were entirely relieved by one operation. In not a single case in 1932 was prostatectomy either necessary or performed because of failure of transurethral resection.

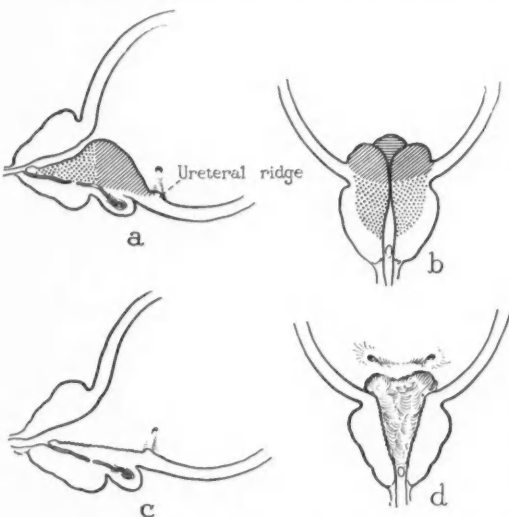


Fig. 1. a and b. The obstructing prostatic tissue, respectively in sagittal and in anteroposterior section. The intravesical tissue is indicated by the diagonal lines, and the intra-urethral tissue by dots; c and d, the obstructing tissue, has been cut away.

These illustrations have been published in the Proceedings of the Staff Meetings of The Mayo Clinic, and will be published in the *American Journal of Surgery*.

In these cases there has been surprisingly little postoperative reaction. Only a few of the physicians had temperatures higher than 101.5 degrees Fahrenheit. The period of hospitalization varied from three to twenty-seven days; the average was seven days. The average total duration of the stay in Rochester was fifteen days. This short period of stay in the hospital and absence from work is very important to a physician. With few exceptions it is just as important to anyone else, and if such results can be accomplished for an unselected group of cases in which all types of hypertrophy are presented, such as occurred among the twenty physicians, it seems to me that the desirability of the method for the layman must be admitted, except in rare cases.

COMMENTS

- The method, as I said before, is not in the experimental stage. It is now the surgeon's responsibility to acquire cystoscopic skill and that familiarity with the topography of the neck of the bladder which results from perfect visualization and exact knowledge of the surgical pathology of the prostate gland. He can, then, after learning the rudiments of the technique of transurethral resection, operate with a lower mortality rate than can the prostatectomist. The surgeon who is not sufficiently experienced to do good cystoscopic work must either acquire the experience, or else perform prostatectomy despite its higher mortality rate. Death from transurethral resection in my experience, and that of my colleagues, has been rare. In the last six years there have been only seven deaths, a mortality rate of 1.4 per cent, and one consecutive series of 291 patients, including these twenty doctors, was operated on without a fatality.

With no exception, the twenty physicians were relieved of their obstructive urinary symptoms. One physician, who could void an excellent stream at the time of dismissal, had residual urine of less than two ounces (60 cubic centimeters). The unstinted expressions of appreciation received in recent letters must have been inspired, in some instances, by the recollections of the days of prostatectomy. All of those who wrote insisted that, if necessary, they would again submit to transurethral resection rather than to any type of prostatectomy.

The question of recurrence seems to be settled by results in a series of 499 cases in which operation was performed between January 1, 1927, and January 1, 1933; there were eleven recurrences, or an incidence of 2.2 per cent. One might argue that it is too soon to quote exact figures concerning recurrence in cases in which the glands were large. I agree, but it is my firm belief that in the future the percentage of recurrence during, say, a period of five years, will be considerably less than the percentage of immediate death noted in the past from prostatectomy. Also, I believe that the percentage of deaths during the five-year period among aged patients, from causes not related to the urinary tract, will be higher than the percentage in which urinary obstruction will recur. Furthermore, I have no doubt that the

incidence of persistent or recurrent urinary distress of any kind will be far less following transurethral resection than has been noted for years following prostatic enucleation. If these predictions prove true, prostatectomy, like prosperity, has had its day. There is a bare possibility of both coming back, but never in their former glory.

The Mayo Clinic.

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DISCUSSION

J. C. NEGLEY, M. D. (527 West Seventh Street, Los Angeles).—Discussion of this subject is difficult from two standpoints. First, taking the author literally when he says, "Therefore, I can relate unlimited details of these cases in proof of my contentions, but must for the sake of brevity make categorical statements which will be subject to doubt." Obviously, since details are absent, statements categorical and subject to doubt, one cannot affirm or deny, except in a categorical manner. Second, so much has been written on this subject in the past two years that little remains to be said.

From May, 1931 to July, 1933, some 149 papers have been reviewed (incidentally a greater number of like papers than were written in all the time previous). Bransford Lewis in the *Urologic and Cutaneous Review* for January, 1933, analyzes some of the current literature, and recites the following complications or adverse results: Failure of relief, with repetition one or more times, 65. Excessive hemorrhage (primary or secondary), 45. Slough, with bladder perforation, 6. Suprapubic cystostomy for hemorrhage or removal of prostate, 25. Other complications, 63. Deaths, 87. None of the above are quoted in the paper under discussion, except a mortality rate of 1.4 per cent and recurrences of 2.2 per cent.

My experience with this method is divided into two periods—the first, from 1923 to 1927, with ten personal cases in which a bar, contracture or small middle lobe, was destroyed by ordinary bipolar coagulating current.

In collaboration with my associate, W. B. Parker, we operated in eight cases with the original Stern resectoscope (incidentally, the first time it was used on the Pacific Coast, to the best of my knowledge). Then came seventeen personal cases with the Collings electrotome. With reluctance, I abandoned these methods because the instruments (urethral and electric energy) were inadequate, and because frequent complications such as hemorrhage, infection in the field, with slough and absorption of toxic products and pyelonephritis made necessary reoperation and shock. With the advent of the Day, McCarthay, and Kirwin punches, I performed a few operations of this type, but soon put the punches aside, as apparently their originators have also done. Since the advent of the newer type of urethral instruments, such as those of McCarthay, Stern-Davis, and Kirwin, with their component electrical energizers, I have either operated on, or had under more or less direct observation a total of 359 resections, both in charity wards and private hospitals. Some of the adverse happenings have been: hemorrhage (immediate or remote), 16; ruptures of the bladder, 9; mortality rate (charity hospitals), 10.2 per cent; mortality rate (private hospitals), 7.2 per cent; pyelitis and nephritis, 11; uremia, 9; incontinence, 1. Reoperated for ruptured bladder, hemorrhage or failure of result, 16. Death from shock, with coagulation of psoas and lumbar muscles, 2. In the remainder of the above cases, results, on the whole, have been brilliant in that the patients have left the hospital much

earlier (average days, 14.8), with urination reestablished earlier, and absence of shock. Removal of fear of operation and an expense-saving process for the patient have resulted.

In a corresponding length of time, 515 prostatectomies and 41 Young punch (open bladder) patients have been studied, with a combined mortality rate of 12.5 per cent in charity hospitals, and 4.9 per cent in private hospitals (average days in hospital, thirty-eight). Complications incident to, or resulting from the surgery were: hemorrhage, 2; septicemia, 1; uremia, 2; pyelonephritis, 4; and ileus, 2.

The author makes one statement with which I am not in accord, namely: "Patients with heart-block, angina pectoris, severe coronary sclerosis, diabetes, cirrhosis of the liver, asthma, extensive carcinoma of the prostate with metastasis, marked obesity and severe renal injury with values for urea as high as 381 milligrams were subjected to transurethral resection in the past year." By inference at least he would have us believe that this class of patients would be suitable for resection, when most of us would consider them not suitable for observation cystoscopy. I believe that for the rank and file of the profession to follow the above would lead to more grief than pleasure.

In conclusion, I believe that the nearer we approach the cold knife or cold punch with our cutting current, and the less coagulation or fulguration is done, the nearer the approach to the perfect result. Despite past experience and study, many will use the resectoscope; but each time we must know exactly where we alight, so that we may break the fall to some extent.

The author and his colleagues are to be congratulated on the excellent results in general, which have not been equaled or even approached by any published reports to date; illustrating the necessary requisites for such results, namely enthusiasm, diligent application, skill, experience, and, above all, a sufficient number of cases in a clinic where pre- and post-operative care are of the highest degree of efficiency.

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ROBERT V. DAY, M. D. (1930 Wilshire Boulevard, Los Angeles).—Doctor Thompson's paper supplies us with abundant data for discussion. At the outset, it must be conceded that his statistics are accurate and cannot be contested. As to his conclusions and inferences, some are irrefutable; but in others I feel that there is room for a considerable difference of opinion.

So far as the relief of urinary obstruction is concerned, there is no question that in most instances this can be accomplished by transurethral prostatic resection. Obstruction being the most serious and vital factor in prostatism, we might feel that when the patient was free from any considerable hindrance to urination—that is to say, with a residual not to exceed one ounce (or none at all)—our result was as good as that following a well-performed prostatectomy. Unfortunately, however, this is not the case in actual clinical experience. A very considerable percentage of these patients who have undergone resection are afflicted with irritation symptoms for long periods. This explanation, I believe, is quite apparent. The hypertrophied median lobe, which in most instances is the real cause of the obstruction, can easily be resected, thereby allowing the patient to urinate readily. On the other hand, resection of the lateral lobes is an unsatisfactory procedure. It is literally impossible to resect the major portion of the lateral lobes transurethrally, that is to say, to really excise these lobes to a point near the capsule and from the vesical aspect down to the apex, without incurring a considerable risk. Remaining portions of the lateral lobes continue to hypertrophy and give rise, clinically, in many cases to urinary irritation of considerable degree. Even when resection is performed on a hypertrophied median lobe with only the slightest enlargement of the lateral lobes, one usually discovers in a few weeks that the laterals have enlarged markedly; due, no doubt, to the stimulation by the cauterization and ensuing infection at the site of the resected area. The method of Bumpus, which Doctor Thompson employs, results in less tissue

sloughing and periprostatic reaction, and consequent irritation symptoms and growth stimulation, than does the radio loop employed in other types of resectoscopes. With radio-loop resectoscopes it is undeniable that a rather extensive periprostatic exudate and ultimate fibrosis result. This may include the seminal vesicles. With the type of resection employed by Doctor Thompson, which was devised and perfected by Doctor Bumpus, the tissue to be removed is first transfixed by needle electrodes and electrodesiccated by means of a d'Arsonval current in order to forestall bleeding, whereupon it is excised with a circular cold steel blade. This method was first employed and embodied in the Day prostatic punch, which instrument is now being modified so that larger bites may be taken in the instances where quite large prostates are attacked. Either the direct or foroblique telescopic vision employed in this instrument affords a splendid perspective. The tendency to periprostatis is much less noticeable when this method is employed.

My feeling is that, whereas most any type of prostate can be successfully resected with a negligible mortality and satisfactory relief of the purely obstructive symptoms, still many of these patients are more or less miserable, which is not the case after a well-performed prostatectomy. The mortality rate is about the same when each is performed by men of outstanding experience and skill in each of the respective procedures. But when a prostatectomy has been done, the patient is entirely well, whereas after a resection a considerable percentage have symptoms of irritation which makes life somewhat miserable. I fear that many of the resected cases will necessitate later prostatectomies or repeated resections. The time has been too short to enable us to determine that question. These cases to which Doctor Thompson refers and reports results after a five-year period, were cases of minor resections, and are not at all comparable with those we are doing nowadays.

Doctor Thompson in his paper, and even in the title of his paper, makes a point of the number of physician patients. Of course, we all know that physicians are prone to take short-cuts in order to dodge what would and should be done with other patients. This was most forcibly brought home to me a few years ago in that, immediately following a description of the Day punch in *The Journal of the American Medical Association*, I was the recipient of a series of letters from physicians all over the country describing various types of prostatism from which they were suffering, and anxious for a urologist to tell them that a punch operation would relieve them of their prostatic ills.

We are hoping that, in lasting end-results, resection will enable us to deal in constantly increasing percentages of cases of prostatism. But after a considerable clinical experience, as well as observation of many cases done by others, and some internationally famous resectionists, I am convinced that we had better wait two or three more years before discarding the operation of prostatectomy.

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MILEY B. WESSON, M. D. (490 Post Street, San Francisco).—Doctor Thompson has casually mentioned several points which are worthy of our serious contemplation. I would hesitate to believe that his concluding statement, "Prostatectomy, like prosperity, has had its day," was correct, for if it is true, then the urologists, as a class, have lost their place in the sun. Urology is a young specialty. Until the introduction of the cystoscope and the development of the pre-operative prostatectomy technique, all genito-urinary work was done by the general surgeons and the venerable urologists. Gradually, due to the activity of high pressure salesmen, cystoscopes have become almost as common in the general practitioner's armamentarium as sphygmometers, and commercial houses are now circularizing the entire profession almost weekly to buy, at bargain prices, some form of resection machine. The urologists should consider seriously the effect of giving up their prostatectomy operation, upon both their patients and their specialty, before being swept off their feet by this commercial propaganda.

The phenomenal success of Hugh H. Young as a prostatectomist is based upon three factors: a profound knowledge of perineal anatomy; surgical technique and an appreciation of the importance of pre-operative care. The same factors are correspondingly important in prostatic resection. Hence, the cases that Doctor Thompson does not "prepare" must be in perfect condition when he first sees them.

There are proportionately no more hypertrophied prostates and median bars in the United States today than there were ten years ago. Outstanding urologists worked for years accumulating a series of one hundred or more prostatectomies, but now practically every man who had the price to buy a resectoscope a year ago has already one hundred or more resections to his credit; some hospital operation schedules show almost as many resections as tonsillectomies. It seems to me that there must be a lot of unnecessary "prostate shaving" going on by the unethical, who prate of how much easier it is to "sell" a patient a resection than a prostatectomy. Unfortunately, anyone who can look through a cystoscope thinks that he is competent to do a resection; consequently we have a rising group of "prostatic surgeons," devoid of training in surgical technique, advancing heretical opinions.

The type of anesthesia used varies with the operator. Dr. John R. Caulk of St. Louis for years has depended upon local anesthesia; and Dr. Julius Fischer of Kansas City and Dr. W. M. Wishard, Jr., of Indianapolis have devised very ingenious needles for novocain infiltration of the prostate that are widely used.

We should all profit from Doctor Thompson's observation that the patients who have long suffered from back pressure are the safest to learn upon, since the hypertrophy of the bladder wall and the trigon lessens the danger of perforation; also that the neophyte had better practice on median bars rather than glandular hypertrophies, as the danger of hemorrhage is less.

One of the reasons for the remarkable success of Doctor Thompson and his colleagues is that they are operating with practically the same instrument with which they do all of their bladder and kidney investigations—a Braasch cystoscope that has been converted into a modified Young's punch by notching the shaft and adding a circular knife. Furthermore, they are meticulous in their attention to postoperative asepsis, and they do not do a lot of massive coagulating and carbonizing to stop hemorrhage. The average urologist uses a Brown-Buerger right-angle cystoscope for his routine work, and has never catheterized a ureter with the McCarthy direct forward vision foroblique penendoscope. Although he uses it for examining the prostatic urethra, he is more or less lost in a bladder with that instrument. However, he introduces the McCarthy resectoscope, orients himself in the prostatic urethra, makes the first cut, and a hemorrhage immediately blurs his field. He then burns wildly with a powerful coagulating current from a spark-gap machine, trusting that he will hit the bleeders, and he usually carbonizes not only the bed of the cut but the surface of the venous trigon that he caused to bleed as he jockeyed his loop into position. He is rarely again oriented throughout the operation, and frequently excises both ureteral orifices. Untoward complications, ranging from pyelonephritis to prostatic abscess or perforation, follow as a matter of course.

A man who is going to do resections with the McCarthy resectoscope should do all of his ureteral catheterizations with the foroblique panendoscope. He should get his cutting current from a tube machine. If there is a severe hemorrhage following a cut, instead of coagulating at random, he should press the sheath of his instrument over the bleeding area, or put in a bag and wait ten minutes for the bleeding vessels to clot. If hemorrhage continues at the end of the physiological clotting time, he can then seal the vessel with the coagulating current and continue with the operation.

Prostatic resection is a very valuable procedure. It is a Young's punch operation, with the danger of hemorrhage minimized; but, as frequently done, the

destruction of tissue from excessive coagulation (carbonization) is really more dangerous than hemorrhage. The man who is not trained in surgery should depend exclusively upon some form of intra-urethral resection (McCarthy, Bumpus, Kirwin, etc.). The urological surgeon, however, should not forget that large hypertrophies can be removed much quicker and with less shock by open prostatectomy (perineal or suprapubic), and that few men have been as successful with resections as have Doctor Thompson and his colleagues at the Mayo Clinic.

Frequently we hear young urologists say that the people have been educated by commercial houses to demand resections, and they are going to have them; if we do not want to do them, someone else will, so it is best to get on the band wagon, or we will have to close up our offices. That is a false statement. For years we have heard the same theory about abortions, and there are just as many people demanding illegal operations as insist upon resections, but their clamor is ignored.

AMEBIASIS—A CLINICAL SUMMARY*

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FOR our purpose here, amebiasis is limited to infestation with *Endamæba histolytica*, and this study is based on four groups of patients. These are: I, a group of 101 in Panama, reported by Anderson¹; II, a group of 92 in San Quentin Prison, reported by Johnstone, David, and Reed²; III, a group of 40 private patients seen in San Francisco and reported in January, 1932, by Reed, Anderson, David, and Leake³; and IV, another private group of 50, seen in San Francisco subsequent to the cases reported under III, just preceding. These four groups will be summarized clinically separately.

PANAMA GROUP

Group I. Anderson reports¹ an incidence of 13.9 per cent *E. histolytica* infection in Santo Tomás Hospital, Panama. Reviewing various studies of incidence, he concludes that the population of California is infected to the extent of \pm 10 per cent. Of 101 amebiasis patients in Santo Tomás Hospital, 31 had diarrhea or dysentery, and 13 constipation. In forty-four there were no gastro-intestinal symptoms. Eighty-eight patients were treated with carbarsone—eighty adults, six children, and two who left the hospital with partial treatment. Thirty-seven of the treated cases were followed one month with six or more stool tests, and but one was not freed of amebas. Diarrhea and dysentery cleared in every case except one pellagrin.

SAN QUENTIN GROUP

Group II. Johnstone, David, and Reed² report a protozoal survey of one thousand inmates of San Quentin prison. Dr. L. L. Stanley, prison

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¹ Read before the General Medicine Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

physician, has commented that this group offers an excellent cross section of California population. Nine and two-tenths per cent of this group were infected with *E. histolytica*. Of the 92 positive cases, 28 complained of indigestion, 16 had diarrhea or dysentery, 23 were subject to constipation, and 39 had no gastro-intestinal disorders. Of the ninety-two, seventy-eight had lived in or visited areas considered to harbor amebas, and thirty-six had at some time lived in the tropics. There was one case of amebic liver abscess. It is interesting to note that, by occupation, 10 were cooks, 7 bakers, 4 waiters, 6 dairymen, and 3 butchers. By nationality there were 64 Americans, 4 American-born negroes, 11 Mexicans, 4 Italians, 2 Filipinos, and 7 scattered foreign.

FIRST BAY REGION GROUP

Group III. This group of forty patients was reported by Reed, Anderson, David, Leake.³ It included 28 Americans, of whom 16 had never left the United States. There were 5 Mexicans and 3 Peruvians, while 4 were scattered. Fifteen occupations were represented, including eleven housewives. In thirty-one the chief symptoms were from the gastro-intestinal tract. Among these, 13 had diarrhea or dysentery, 7 suffered from constipation, and 4 from abdominal pain. The average duration of illness was two years. Six had undergone appendectomy with no benefit. Twenty-nine patients had associated diagnoses, including six with chronic arthritis.

SECOND BAY REGION GROUP

Group IV. This group of fifty private patients is reported here for the first time. The clinical data are as follows:

Age and Sex.—Twenty males, averaging 40 years of age, ranging from 18 to 60. Thirty females, averaging 39.1 years of age, ranging from 20 to 58.

Residence.—Of the fifty patients, fifteen, or 30 per cent, had lived only in California. The other thirty-five, in addition to their life in California, had spent varying periods in China (7), western United States (11), Midwest (6), Central and South America (4), Mexico (4), Hawaii (5), Pennsylvania, England, France and Canada (two each), and the Philippines and Palestine (one each). Four had traveled extensively around the world.

Occupation.—Of the fifty patients, 19 were engaged in some line of business, 17 were housewives, 3 were farmers, 2 each were mechanics, missionaries, nurses, or teachers, and 1 was a social worker, 1 was a student, and 1 was an enlisted navy man. The high percentage of housewives is to be noted in view of the probable chief means of transfer of amebiasis by food handlers.

Symptoms.—Of the fifty patients, forty-eight had symptoms referable in a major degree to the gastro-intestinal tract. In two the finding of amebiasis was the result of detailed study made necessary by obscurity of diagnosis. These figures plainly indicate that no patient with any type of

TABLE 1.—Indicated Major Symptoms in a Group of Fifty Bay Region Patients

Diarrhea	28	Flatulence	9
Constipation	24	Neuroses	9
Abdominal pain	21	Fever	6
Fatigue	21	Nausea or vomiting	5
Dysentery	18	Arthritis	4
Low weight	14	Anemia (secondary)	2
		Liver abscess	1

Note: The term diarrhea as here used is intended to mean an increased number of bowel movements, while dysentery means frequent stools, containing blood and mucus, and attended by pain.

gastro-intestinal symptoms has received proper medical attention unless adequate search for amebas has been made. The same rule should apply to all cases of obscure diagnosis of any type, and especially where fatigability, neurasthenia, neuroses, and unexplained low weight are present. In detail the major symptoms in these fifty cases were as indicated in Table 1.

Comment.—Of the six patients with fever, all were demonstrably due to secondary pyogenic infection. There is little evidence that uncomplicated amebic infection produces fever. Of the four cases of arthritis, all showed a definite and repeated association between increase or recurrence of colonic symptoms, reappearance of amebas in the stools, and arthritic symptoms. This association was too striking to be casual. It suggests that streptococci find entry to the system through the portal of amebic lesions, which thus must be classed along with other recognized foci of infection.

Comparison of the residence history above with the percentage of dysentery (36 per cent) leads one to question the prevailing view that amebic dysentery is uncommon outside the tropics and also is relatively less common in proportion to the number of cyst passers. This is discussed further below, under laboratory findings.

There was evidence of hepatitis in fifteen of the fifty cases, consisting of enlargement of the liver, tenderness, pain, or increased icteric index. It is probable that all cases of amebiasis have a hepatitis of some degree, usually subclinical.

Blood pressure findings were interesting in view of the large number (twenty-one, or 42 per cent) who complained of asthenia and easy fatigue. Of thirty-eight cases, two were slightly above normal, these being between 130 and 140 systolic (Tycos apparatus). Twenty were normal (between 114 and 130 systolic) and sixteen were below 112 systolic. Amebiasis seems to depress the blood pressure in a large percentage of cases.

Of the forty-four cases subjected to sigmoidoscopy, sixteen were normal and twenty-eight pathologic. In seven of these cases diagnosis of amebiasis was made solely by sigmoidoscopic smears. This indicates the advantage of this procedure as a routine diagnostic method.

In view of the average duration of present illness of eight years in forty-one patients and "many years" in nine patients, it is interesting to note that twenty had had previous treatment for amebiasis, usually intensive and repeated, while

in thirty cases amebiasis had not been found and often was not even suspected or considered.

LABORATORY FINDINGS:

Wassermann and *Kahn* tests were negative in all the series.

Stools.—All specimens were fixed immediately after passage or directly from sigmoidoscopic smears, in Schaudinn's solution and stained by iron-hematoxylin.⁴ Of the fifty cases, 38 had motile forms of *E. histolytica* in the stools, 15 had encysted forms, and 7 showed both cysts and active forms. Of the thirty-eight patients having active amebae, three, or 8 per cent, had neither diarrhea nor dysentery.

It is generally taught that outside of the tropical zone, amebic dysentery is relatively uncommon, and also that motile forms are associated closely with diarrhea or dysentery; and in the absence of diarrhea or dysentery, cysts are to be expected. Yet here we find in San Francisco 36 per cent of fifty cases showing dysentery, and 76 per cent of fifty cases showing motile amebae. These observations lead to certain important conclusions:

1. It is possible and probable that the ratio of amebic dysentery to amebiasis is the same in temperate climates as in hot climates. The ease with which diarrhea and dysentery develop in amebiasis in hot weather may well have no relation to different races or strains of amebae, but may be secondary entirely to physiologic intestinal and hepatic changes induced by hot weather and improper food. The resistance to treatment shown by some cases may be an indication of a difference in strain or race. This will be discussed later.

2. If 76 per cent of the cases here reported showed motile amebae, and if stool examination had been limited to cold specimens sent to the laboratory in the usual containers on the same or succeeding days, it is certain that in a majority of the series the diagnosis would have been entirely missed. Immediate fresh examination of specimens, or immediate fixation of fresh specimens, is a necessity, as motile amebae die quickly and thus the diagnosis will be missed. It is to be remembered that there is no diagnosis of amebiasis other than microscopic demonstration of amebas.

P. S. P. Test.—Phenolsulphonephthalein tests were done on twenty-three cases with an average excretion of 53.8 per cent. Of these twenty-three, five had some indication of hepatitis and averaged an excretion of 52 per cent. The other eighteen, with no clinical indications of liver damage, gave an average excretion of 54.8 per cent. The urine was negative in all cases but one, which was complicated by cystitis.

Gastric Analysis.—In fifteen patients, with alcohol meal, gastric analysis gave the following average:

	Fasting	I	II	III
Free HCl	20	16	25	26
Total acid	33	24	34	47

Four cases (26.6 per cent) showed hyperacidity and eleven (73.4 per cent) were entirely normal.

Blood Count.—The average blood count was as follows:

Hemoglobin (Sahli), 82.5 per cent (forty-seven cases).

White cells, 7,800 (forty-eight cases). Of these, seven had a count of 10,000 or more, all having secondary pyogenic infection. Excluding these seven, the average white count on forty-one cases was 7,078.

Red cells, 4,453,000 (forty-eight cases).

Polynuclear cells, 61.4 per cent.

Lymphocytes, 32.6 per cent.

Mononuclears, 3.5 per cent.

Eosinophils, 2.0 per cent.

Basophils, 0.35 per cent.

In general, the average blood count is normal with a low white count.

TREATMENT:

Of the fifty patients, forty-nine received carbarsone. Thirty-one of these had one oral course, thirteen had two oral courses. Two had three oral courses, and three had over three oral courses. A total of thirteen were given rectal courses of carbarsone,⁵ seven patients receiving one course, one patient two courses, and three patients three courses. Of forty-nine patients receiving carbarsone, eleven also were given vioform. Additional treatment was as follows: Fourteen received strict dietary oversight alone, ten were treated for complications unrelated to amebiasis, and sixteen received drug adjuvants such as tannin, calcium, and bismuth. (a) Of the twenty patients in the entire series who had received previous treatment for amebiasis, fourteen were entirely relieved of symptoms by the present treatment, and sixteen were freed of protozoa for an average follow-up period of five and one-tenth months. Of the other four cases, one could not be followed and three are discussed under the resistant cases below. (b) Of the thirty patients who had had no previous treatment for amebiasis, twenty-four were entirely relieved of symptoms and twenty-six were free of protozoa for an average follow-up period of four and eight-tenths months. Of the other four cases, one would not submit to treatment at all, one left town immediately, and two are discussed under resistant cases below.

RESISTANT CASES:

Of the fifty cases here reported, five, or 10 per cent, proved resistant to treatment in that symptoms and amebae persistently recurred after treatment.⁶ Two of these cases, C. L. 1 and R. E. 44, had gross pathology in and around the colon and rectum sufficient to explain the resistance. This pathology consisted of thickening of the bowel wall, granulomatous infiltrations and masses, and pararectal lesions consisting of granulomatous tissue, fibrous tissue, and the products of secondary bacterial infection. In this tissue the amebae are mechanically inaccessible to drugs, and the bacterial infection further tends to maintain the pathology. Here surgical intervention is indi-

cated. Ileostomy and/or removal of pararectal infiltrations offer the best hope of eventual cure. The other three cases raise the old question of a difference in race or strain. This problem is perhaps the most outstanding now in clinical amebiasis.⁶ It is to be attacked along two lines: (1) Are there differences in morphology and morphologic life cycle of these resistant strains? (2) Are there biologic or functional differences that make these strains resistant?

A short summary of these five cases follows:

REPORT OF CASES

CASE 1.—Male, 25. American. Farmer. Always lived in the San Joaquin Valley. For six years he has had severe dysentery with much blood, abdominal pain, loss of forty pounds in weight, weakness, and for two years extensive pararectal infiltration and infection, with fistulous tracts. Recurring low fever was present. His blood count showed 75 per cent hemoglobin (Sahli), 7,800 white cells; 3,910,000 red cells; polymorphonuclears, 65; lymphocytes, 28; mononuclears, 3; and eosinophils, 4. P. S. P., 65 per cent. Urine, clear. Stools constantly loaded with active *Endamaba histolytica*. Cysts were never found. Smears showed predominant Gram-negative flora. Stool culture showed *Bacillus coli* with many streptococci. Sigmoidoscope showed extensive ulceration to 26 centimeters, with abundant gray mucus and blood. An extensive pararectal clean-up was done by Dr. Dudley Smith.

Treatment consisted of repeated courses of carbarsone orally and rectally, vioform orally, tannic acid instillations, acriflavine irrigations, and bismuth orally. Previous treatment for six years had been directed to the amebic infection, but had never controlled the symptoms. It had included extensive and repeated courses of emetin, acetarsone, chiniofon, nearsphenamin, acriflavine irrigations, and stool vaccines.

At present there has been a gain of thirty-five pounds in weight, no blood in stools, no fever, no amebas found for seven months, abundant mucus, three to four bowel movements daily, and moderate abdominal pain. The patient is not cured, but it is difficult to say if he is not in the stage of a residual chronic ulcerative colitis. If further improvement is arrested, ileostomy is indicated.

CASE 2.—Mrs. J. J. C., 43. Housewife. American. Age, 32. Has lived in Texas and California, with one trip into Mexico. For six years she has had severe attacks of dysentery with excessive blood and mucus, interspersed with constipation. She has had no fever, and no loss of weight. The sigmoid and cecum were palpable and tender. The sigmoidoscope showed heavy ulceration covered with gray mucus and blood. The stools showed numerous active *E. histolytica*, together with cysts of *E. nana*, *E. coli*, and *Iodamaba*. P. S. P. excretion was 50 per cent. There was no anemia. White cells were 13,650, with 71 polynuclears, 28 lymphocytes, and 1 mononuclear.

Previous treatment has been symptomatic and ineffective. Amebiasis was never suspected. Present treatment consisted of repeated courses of carbarsone rectally and orally, vioform orally, one course of emetin, acriflavine and tannic acid irrigations, and bismuth. A high protein, high vitamin, smooth diet and abundant calcium were given. A course of heptyl resorcinol was given for ten days at the beginning of treatment, with no benefit. Motile amebae and sigmoidal ulceration persisted throughout. There has been improvement, shown by decreased blood, mucus and bowel movements, but not yet a cure. Active amebae are still present after fifteen months' treatment.

CASE 3.—Mrs. R. E., 44. American. Housewife. Age, 32. Has lived only in California. For three years she has had recurring severe dysentery, with excessive

loss of blood and anemia that has twice required transfusion. Her weight has been constant. Fatigue has been extreme. Examination showed a relaxed abdomen with a tender, palpable, greatly thickened colon, which could be outlined for its entire length. Sigmoidoscopic examination showed extreme ulceration to 26 centimeters, with much gray mucus and blood. A low fever accompanied the dysenteric episodes. The stools were loaded with motile *E. histolytica*. P. S. P. excretion was 70 per cent. The blood count was as follows: hemoglobin (Sahli), 50 per cent; red cells, 3,790,000; white cells, 9,280; polynuclears, 61; lymphocytes, 32; mononuclears, 3; eosinophils, 2; and basophils, 2.

Treatment previously had included carbarsone, emetin and ipecac. Six months' treatment by us has included repeated courses of carbarsone, orally and rectally; one course of emetin, repeated vioform, bismuth, and acriflavine and tannic acid irrigations. There has been a moderate improvement, but dysentery still recurs, and the granulomatous infiltration of the colon persists. Ileostomy is undoubtedly indicated.

CASE 4.—Mrs. E. S., 37. American. Housewife. Age, 26. Has lived only in California until a trip to Mexico four months ago, during which she developed dysentery with excessive hemorrhage. She has had a low fever and much abdominal pain. The sigmoidoscope showed extensive ulceration, with excess of gray mucus and blood. The cecum and sigmoid are palpable and tender. Hemoglobin (Sahli) was 83 per cent with a normal blood count. P. S. P. excretion, 55. The stools showed active *E. histolytica*.

Treatment included repeated courses of carbarsone orally and rectally, vioform, emetin, bismuth and attention to diet, vitamin and calcium. There has been great improvement, but there are still recurring periods of bleeding, dysentery, and active amebae.

CASE 5.—Mrs. A. V., 46. American. Secretary. Age, 38. Had lived in California, Canada, Hawaii, and during the last three years in Shanghai. Fifteen months ago, in Shanghai, she developed severe dysentery with much hemorrhage. There was no fever or loss of weight. The sigmoid and cecum were tender and palpable, and the liver was one finger below the costal margin. Gastro-intestinal x-rays were negative. The sigmoidoscope showed an intense congestion of the mucosa, with much gray mucus and blood. The blood showed 74 per cent hemoglobin (Sahli), 3,590,000 red cells; 12,160 white cells, with 59 polynuclears, 34 lymphocytes, 4 mononuclears, and 3 eosinophils. P. S. P. excretion was 57 per cent. The stools showed both cysts and active forms of *E. histolytica*, although the patient had never been subject to constipation, and diarrhea or dysentery was nearly constant.

Previous treatment had consisted of intensive and repeated courses of emetin and chiniofon. These gave clinical improvement, but not cure, and the amebae persisted as noted above. She was given one course each of carbarsone orally and rectally, and of vioform, with the routine diet. Clinical improvement was again noticeable, but motile amebae persisted in the stools up to the time of her leaving this district.

SUMMARY

General conclusions from the four groups of patients under consideration may be summarized as follows:

1. **Incidence.** The findings of previous reports are confirmed, in general, that amebiasis has wide, if not universal distribution in the United States. It is further indicated that the incidence in California approximates 10 per cent of the population. The infection is heavily endemic in California, and the incidence is not dependent on imported cases. The high rate among housewives

is of importance, with reference to prevention, because of the primary method of transmission by food handlers. Occupation and previous residence are not so important as defective hygiene in determining incidence, although residence in warm climates tends to increase the rate of infection, probably because in such places public and personal hygiene is less good. The problem of adequate control of food handlers must be emphasized. Age and sex are unimportant.

2. *Clinical Importance.* There seems to be adequate ground for the conclusion that a disease as widespread and serious as amebiasis should be considered more seriously from the standpoint of diagnosis by the practicing physician, and also it seems justifiable to conclude that no patient with gastro-intestinal symptoms or an obscure or incomplete diagnosis, can be considered to have proper attention without adequate study for amebiasis.

3. *Diagnosis* depends solely on identification of *E. histolytica*. For best possible results this requires initial examination of unstained smears in saline, followed by preparation of fixed smears at once from fresh stool specimens, their staining by the iron-hematoxylin method, and their examination by a competent technician.⁴ Six specimens on successive days, including specimens after Epsom salts and by sigmoidoscope, must be examined before a negative diagnosis is reasonably assured.

4. *The clinical picture* may be strongly suggestive, but is never diagnostic. Amebiasis is a systemic disease, located primarily in the colon, with frequent parasitic invasion of the liver and other organs, and with frequent general and constitutional symptoms. There is no evidence of spontaneous cure. It is always a potential danger to the host, and an actual danger in transfer to others. Symptoms may not appear from the intestinal tract. In California probably not over one-third of the cases are dysenteric, and, conversely, at least two-thirds are nondysenteric. Even with severe chronic dysentery, there may be no loss of weight and no anemia. One of the most serious complications is secondary bacterial infection of amebic lesions. Such lesions in the colon may act in a manner analogous to other foci of infection. One of the most serious sequels is chronic ulcerative colitis and/or development of extensive granulomatous masses involving the colonic wall. About 10 per cent of the cases are so resistant to treatment as to be practically incurable medically.

5. *Treatment* cannot be standardized too far without losing effectiveness. The principles which we attempt to follow in arranging a treatment course for the individual patient are in general as follows:

(a) Clinical and laboratory evidence of hepatitis is carefully noted, and the use of arsenicals is closely guarded accordingly. Associated diagnoses receive attention and the general status of the patient is improved in every possible way.

(b) Patients showing cysts, with little or no diarrhea or dysentery, are given a routine course of carbarsone orally.⁷

(c) In the presence of motile forms, carbarsone is given rectally in addition.⁸

(d) In cases where amebas persist, or as a primary treatment, vioform orally is given in 0.5 gram dosage twice daily for ten days.⁸

(e) These courses are alternated or repeated, with intercurrent free periods of ten days for full drug excretion, according to persistence or re-appearance of amebas in the stools.

(f) Resistant cases may receive, in addition, emetin hypodermically, in appropriate dosage. We are doubtful as to the actual added benefit from this procedure, although emetin is the drug of choice in frank amebic hepatitis.

(g) Tannin preparations and bismuth subcarbonate are used in persistent diarrheas and dysenteries symptomatically, combined with belladonna where pain is excessive.

(h) Dietary principles in severe resistant cases include high protein, smooth diets, with a minimum of starch. Calcium and vitamin contents are kept high by use of tribasic calcium phosphate, dicalcium phosphate, and vitamin concentrates, especially American wheat kernels and extract of brewer's yeast.

(i) Resistant cases, and those with incurable infiltrations and chronic ulcerative colitis, may require surgical treatment, consisting of appendectomy, ileostomy, pararectal and other procedures. Autogenous stool vaccines are of value in some cases where secondary infection prevents cure. Protein shock is occasionally of use. Colon irrigations with bactericidal solutions such as acriflavine, are helpful for bacterial complications. We have found a few ounces of one per cent tannic acid of symptomatic help where rectal bleeding is prominent.

350 Post Street.

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DISCUSSION

JOHN V. BARROW, M. D. (1930 Wilshire Boulevard, Los Angeles).—The incidence of amebiasis in temperate latitudes is generally underestimated by clinicians. There is no cross section report of any community on this subject. The incidence may be more than 10 per cent in one type of medical practice, and far below that estimate in the average business group. It may be encountered by any physician at any time.

No standard has yet been set as to the total symptomatology of amebiasis. Doctor Reed's work shows the enormous difference between the average report of cases and the one done by a careful clinician. His first group shows a paucity of gastro-intestinal symptoms. Group number 4 shows their almost universal occurrence. We agree with Doctor Reed that careful physical and clinical examinations will show comparatively few cases without gastro-intestinal symptoms. The percentage of arthritic symptoms is unusually small, but the causal relationship is clearly indicated. In regard to the arthritic symptoms and streptococci, the observations are timely. Recently Colonel Acton of Calcutta emphasizes the increase of streptococcus colonies in the colon of amebic infections. The ameba has the power to reduce the tissue resistance in the colon at the site of ulcers. The colonies find a particularly fine medium of growth in the presence of amebiasis. With resistance reduced and the bacteria increased, the invasion of the blood stream by streptococci is a natural sequel. Bacterial emboli give rise to heart, nerve and joint pathology which is unmistakable. Roos of Loma Linda has reported but not published these facts.

The clinical findings and laboratory work are admirably set forth in Doctor Reed's paper. He shows that amebiasis is what Musgrave claimed—an invasion of the system by the products and sequences of amebic infection. The white cell count is higher than the average for these cases. The author correctly explains the rise as due to pyogenic infection. The low white cell count is undoubtedly the rule.

Of the drugs used for treatment, carbarsone is undoubtedly one of the best arsenicals. The different forms of oxyquinilin, such as vioform, are good. Doctor Reed suggests the precaution, which I have always advised and exercised, about emetin. It should never be used as an amebicide alone, but should be given to protect the liver. It has a tonic action on the intestinal mucosa and, possibly, on other glandular structures. If given in a tonic way, it is always helpful and may be continued over a comparatively long period of time with benefit from first to last. The one-grain dose should seldom, if ever, be used.

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FLETCHER B. TAYLOR, M. D. (400 Twenty-ninth Street, Oakland).—This compilation makes Doctor Reed's experience available to all of us, and broadens our approach to the study of amebiasis in our own patients. Several practical points will bear reemphasis.

1. We must especially scrutinize the casual patient with indefinite symptoms. As in other protozoal diseases, diffuse systemic complaints often predominate, and local symptoms may be completely in abeyance.

2. Doctor Reed mentions two of five resistant cases which did not respond to treatment because of "thickening of the bowel wall" and "granulomatous infiltrations and masses." The other three were resistant presumably because of difference in the form or behavior of the ameba. But they also showed gross mucous membrane lesions when proctoscoped: "heavy ulceration," "extensive ulceration" and "intense congestion of the mucosa with much gray mucus and blood," respectively. Given a case of amebiasis, we may then expect our greatest trouble in curing those with visible changes in the rectal mucosa.

3. There is a rather discouraging note in the report that six out of forty patients had had removal of the appendix without benefit, and later the ameba was found. Each of these six took a one per cent chance on surgical death, and spent \$500 on money or medical time on false grounds. This recommends investiga-

tion for ameba in all cases of "chronic appendicitis." If there are positive findings, remove the ameba before removing the appendix.

4. For those of us who are away from medical schools, the problem of diagnosis is a real one. Most of Doctor Reed's cases are diagnosed on motile forms. These motile forms are obtained by direct rectal smear or by examination of stool specimens immediately after passing. For proper diagnosis the patient must report in person to someone who can recognize the motile ameba. If this is not possible, smears may be prepared, "fixed" and forwarded according to a plan previously outlined by Doctor Reed.

5. Food handlers are important carriers of infection. Since Doctor Reed compiled these statistics there has been an important "epidemic" of acute amebiasis emanating from a kitchen employee in a large Chicago hotel.

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DUDLEY SMITH, M. D. (450 Sutter Street, San Francisco).—It will no doubt be startling to many physicians to have it brought to their attention that about ten per cent of the population of California is infected with *Endameba histolytica*. This disease can no longer be classified as tropical, for it occurs in every one of the United States and, as Doctor Reed has pointed out, a large proportion of its victims have never been outside the States, and many never outside their own state. In view of its frequent incidence, its wide distribution and the serious disability caused by this disease, I am glad that Doctor Reed has stressed the importance of "adequate" study for amebiasis of all patients with gastro-intestinal symptoms and those with obscure or incomplete diagnoses. And I am glad that he has again pointed out what he means by adequate study, for I do not doubt that the experience of many physicians parallels my own, in that I have many times had repeated negative reports for amebiasis in a patient who has been proven to have the disease when "adequate study" has been instituted. Examination of cold stools sent to the university at Berkeley costs little or nothing, and is worth less.

When surgical sidetracking of the fecal stream becomes necessary in resistant cases, I believe the cecostomy originated by Dr. Charles Phillips of Los Angeles, and described in *CALIFORNIA AND WESTERN MEDICINE* for June, 1925, has many and important advantages over appendicostomy and ileostomy.

NON-MALIGNANT LESIONS OF THE COLON
—THEIR ROENTGENOLOGICAL DIAGNOSIS*

By R. G. TAYLOR, M. D.
Los Angeles

DISCUSSION by Carl B. Bowen, M. D., Oakland; Henry Snure, M. D., Los Angeles; L. Henry Garland, M. D., San Francisco.

A ROENTGEN examination of the colon is made by observing the opaque meal after it has reached the colon. These observations are best made six hours after the administration of the meal, and at such subsequent times as the progress and circumstances seem to require. Also, very valuable information can be obtained by the administration of an opaque enema.

THE OPAQUE MEAL

With the meal at six hours it has generally progressed so that the cecum is outlined. At nine hours the small bowel is nearly empty, and the head of the meal has generally progressed into

* From the Hospital of the Good Samaritan, Los Angeles.
* Read before the joint meeting of the Radiology and General Surgery Sections of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

the descending portion of the colon, or to the splenic flexure at least. At twenty-four hours the whole colon is generally fairly well outlined. Questions of local delays and general progress of the meal are obtained by observations on subsequent days, if thought desirable. In cases of disturbed motility, there may be extremely rapid emptying of certain portions of the bowel, or the whole bowel may be practically empty twenty-four hours after the administration of the meal; or there may be marked sluggishness and stasis in its movement. This can be either local or general, and can be due either to functional or organic changes. Observations should be made on the fluoroscope, and the bowel observed under the palpating hand or instrument. Films should be made, in our opinion, preferably in the supine position. This gives the same view and relation of the structures as seen in the fluoroscope. It requires making films with the fluoroscopic tube; this has offered some technical difficulties in the past that are not as serious at the present time, when the double focus tube can be used, taking the fine focus for fluoroscopic work and the broad focus for radiographic work. The extra trouble and time, in our opinion, is compensated for by the fact that we have a permanent record which closely simulates the fluoroscopic observation.

We also place a high value on the films made in the erect position, as well as supine. This demonstrates fixation or mobility at times even better than can be shown by palpation.

In giving the enemas it is not necessary to use much pressure, and it is better not to give them rapidly lest spasm and cramps, with difficulty in retention, result.

We wish to lay particular stress on an observation made after the patient has evacuated the bulk of the injected material. We also wish to stress both with the meal and with enemas, observations made on the fluoroscope, and with films when desirable, in oblique positions. Many sharp kinks or angulations resolve themselves into harmless curves when seen in proper cross sections. Overlapping loops of bowel which cannot be pushed aside or separated sufficiently for complete visualization, can frequently be untangled and shown in their practical entirety. This is especially true in the sigmoid region.

The point should be stressed that an opinion as to the complete absence of pathologic changes in the lower sigmoid and rectum is seldom justified. These regions are hard to visualize except when distended, in which case many lesions will be entirely masked and not visible. Fortunately, these regions can be better reached and examined with rectal and proctoscopic instruments. We would like to express the opinion that this type of examination is not done frequently enough. Patients with gastro-intestinal symptoms are given a meal and an enema, without the rectum and lower sigmoid receiving the proper attention.

BOWEL ANOMALIES

Anomalies are not distinctly pathologic in that many of them are not symptom-producing. They

are of many kinds and degrees, and result chiefly from failure of fixation, or rotation from the embryonic stage and position of the bowel. The most common anomalies are the failure of complete rotation on the right side, with lack of fixation in the hepatic flexure region, the cecum being frequently found up under the liver, the appendix on the right side, and with all degrees of mobility. Another fairly common condition is to find practically all the bowel on the left.

The other common anomalies consist chiefly of redundancies with extra loops. Many of these are probably symptom-producing in that there is an unusually long sojourn of the bowel material, and disturbances of motility. In any event, they are generally quite evident, and offer no particular difficulty in diagnosis.

ADHESIONS

A diagnosis of adhesions rests largely with the fluoroscopic observations, in which, with the meal or enema, narrowed and fixed areas can be made out. The question of fixation, of course, can only be definitely determined by manual palpation on the fluoroscope, or occasionally by taking supine, or prone, and erect films. Ordinarily not much difficulty is had in differentiating adhesions from spasm on account of the evanescent character of the latter; or from new growths where the actual organic change in the bowel wall is likely to be more marked.

Adhesions may fix the colon either in a normal or abnormal position. Stenotic segments may show; these generally have a dilatation proximal, with stasis. There may be abnormal adhesions of single loops to each other, or to other structures in the abdomen; a high, otherwise movable sigmoid may be adherent to the appendiceal area, etc.

The differentiation between adhesions and adventitious bands is not always easy or possible. Usually the adhesions have some fixation; the bands are generally found in a colon that is hypermobile.

ADVENTITIOUS BANDS

Adventitious bands with reference to the large bowel are most commonly found, in spite of much testimony in the literature to the contrary, involving the ascending colon and cecal region. These are not easily demonstrable by enema; in fact, an enema with observations only of the distended bowel will absolutely mask any of the usual findings that would suggest an adventitious band. It happens occasionally in a very advanced stage that fixation similar to adhesions is produced, but commonly they are attached to a mobile right colon that has failed from a developmental standpoint in fixation of the hepatic flexure. The lesion as seen roentgenologically is caused by a twist or torsion of the bowel at the point of attachment of the band to the colon. It is not usually observed with the patient supine or prone, with the cecum up on the ilium, but only when the cecum is deep in the pelvis, either from its being taken there by its loaded weight or when in the erect position.

DIVERTICULA

Diverticula are found in the colon and vary greatly in their location and number. They are most commonly found in the descending and sigmoid portions, but may be found in the transverse portion, or cecum and ascending colon. They may vary greatly in size as well as in number.

Diverticulosis is probably most reliably and best shown by the use of the enema. The twenty-four and forty-eight hour observations of the meal after the colon is partly empty frequently give us information, but usually a better visualization will be had with the enema. It should be remembered, however, that a colon well distended with an enema frequently hides many of the small diverticula, and that observation or films should always be made following the patient's evacuation of the enema.

Diverticulosis needs chiefly to be differentiated from new growth. This is sometimes difficult. If diverticulitis is present, there may be enough swelling and edema to block the diverticula, and no definite lesions will receive the opaque solution and so be demonstrated. Again, diverticula may be found in connection with new growth, and it may be difficult definitely to differentiate deformity of the bowel due to new growth and the possible deformity due to inflammatory reaction in connection with diverticulitis.

OTHER PATHOLOGIC CONDITIONS

Tuberculosis.—Tuberculosis most frequently occurs in the cecal region. This lesion as observed in connection with the meal shows evidence of spasm, poor and incomplete filling of the cecum, but most characteristic of all, an intolerance of the diseased portion of the bowel to the presence of the bowel contents. This, however, is also characteristic of most any type of ulceration in the colon. The deformity may be connected with considerable fixation, if it is a lesion of long standing, due to pericecal and cecal wall inflammation. It probably cannot be differentiated from so-called non-specific ulceration in the terminal ileum and cecum. In ulceration connected with ordinary types of colitis, the lesions are generally evidenced in the descending and pelvic colons, and the use of the proctoscope almost always demonstrates lesions which can be thus examined, and specimens obtained for culture purposes.

Ileitis.—Cases of so-called regional ileitis which have been recently described are probably difficult to differentiate by the x-ray examination alone. As a rule, the cecum is not as markedly involved as usually found in tuberculosis. However, after fistula are formed, there may be enough change in the cecal wall to suggest either new growth or tuberculosis. Tuberculous lesions in the cecum that have existed for some time, sometimes cause enough scar tissue formation and stiffening of the cecal wall to mask the evidence of spasm with consequent decrease in motility, which are two of the important signs connected with ulcerative colon lesions.

Intussusception.—Intussusception is not as common in the colon as it is in the small bowel. However, it does occur. All the cases we have observed in the colon have been in bowels that were extremely redundant, with long, mobile loops. A not very uncommon finding is a prolapse of the small bowel into the cecum, frequently the result of tumors in the small bowel. These are sometimes hard to recognize unless one pays considerable attention to the history and clinical findings, and then they frequently can be picked up. They may be intermittent, and reduce themselves, and reform. We have had one case in which the tumor was produced in a paroxysm of spasm in the patient, while the abdomen was being palpated; very shortly afterward the pain suddenly stopped and the tumor disappeared. This happened while the patient was being observed on the fluoroscope, but unfortunately the bowel was not filled with barium at the time, so a good radiograph was not obtained. Intussusception of the small bowel into the cecum can simulate new growth and possibly suggest tuberculosis.

Colitis.—Colitis in its commoner forms, so far as the roentgen ray is concerned, is functional without actual demonstrable lesions except evidence of spasm. However, in advanced forms and in ulcerative varieties where actual organic changes are present in the bowel wall, the appearances are usually quite characteristic. In the presence of ulceration, the usual hypermotility, local tenderness, spasm, and intolerance of bowel contents, are seen, similar to that found in tuberculosis. In more advanced lesions the bowel assumes a tubular form and is frequently shortened. The loops disappear and the bowel becomes rigid, contracted and immovable. These lesions occur usually in the distal colon, descending and pelvic colons. Spasm is sufficient, sometimes, to simulate them. Usually a careful and extended examination will differentiate the non-organic deformity due to spasm.

Non-malignant Polyposis.—Non-malignant polyposis is occasionally seen. It has been quite rare in my experience, however, and I have no good film to show you. It is frequently difficult to demonstrate, although the use of barium in small quantities followed by expansion of the colon with air has resulted in some striking pictures, especially as recently reported by Weber.

1212 Shatto Street.

DISCUSSION

CARL B. BOWEN, M.D. (1624 Franklin Street, Oakland).—In addition to points mentioned by Doctor Taylor in the differential diagnosis of carcinoma and inflammatory lesions of the colon, it is well to keep in mind that defects due to inflammatory lesions are usually longer and more symmetrical.

I should like to ask Doctor Taylor how frequently he has found mobile ceca associated with pain and tenderness in the right lower quadrant, particularly after a six-hour meal; and if he has found such to be the case, how he explains this pain and tenderness? Also, if he finds x-ray evidence of pressure on the duodenum as a result of drag from a heavily loaded mobile cecum and, if so, how frequently?

HENRY SNURE, M. D. (1501 South Figueroa Street, Los Angeles).—I find my opinions on the diagnosis of non-malignant colon lesions to be in accord with those of Doctor Taylor. Although he did not mention it, I assume that he makes a plain film of the abdomen before the administration of barium, to rule out partial obstructions and megacolon that may be visualized by the gas shadows; also to rule out urinary or biliary calculi, malignant metastasis to spine, etc., which might give clinical signs suggestive of colon pathology, and be obscured by the barium shadows. In addition to the routine films suggested for the opaque enema study, I include an additional prone film which visualizes the transverse colon and pelvic colon better, I think, than do the other views. In a few cases I have found that diverticula do not fill until the seventy-two-hour film is made; however, the opaque enema usually suggests their presence by many fine so-called saw-tooth spastic changes, particularly in the pelvic colon. Films made of the colon an hour or so apart frequently show marked variations of outline; in some cases the redundant loops almost disappear, suggesting longitudinal contraction of the colon.

Kantor has shown that the average vertical mobility of the hepatic flexure is $1\frac{1}{2}$ inches, that of the cecum $1\frac{1}{4}$ inches. Mobility of less than one inch of the cecum is considered as fixation, and more than $2\frac{1}{2}$ inches is considered hypermobility. Pain in the lower right quadrant, tenderness and a predisposition to colonic stasis are usually associated with hypermobility of the hepatic flexure. Hypermobility of the cecum is often noted in the irritable type of colon.

It cannot be too strongly emphasized that lesions in the rectum are difficult to visualize by barium mixture alone, or combined with air. The patient should always be examined by the proctoscope regardless of the roentgen-ray findings.

I should like, also, to ask Doctor Taylor whether he attaches any significance to the insufficiency of the ileocecal valve, when no gross changes of the outline can be demonstrated.

✽

L. HENRY GARLAND, M. D. (450 Sutter Street, San Francisco).—Doctor Taylor presents a concise summary of the differential points in the roentgen diagnosis of non-malignant colon lesions. His opening remarks on technique are valuable and important. We unquestionably miss many organic lesions of the large bowel by too rapid and too routine a type of examination. The suggestion that the double-focus type of x-ray tube might be used in the fluoroscope is, I think, extremely interesting. However, to secure really satisfactory films on the fluoroscopic table would necessitate some modification of most American-made fluoroscopes, *e. g.*, a much more rugged type of screen and cassette holder, a more readily adjustable target-screen distance device, better protection for the operator, etc. As Doctor Taylor implies, fluoroscopic examination must always be considered incomplete; adequate radiographic examination is needed as well.

In connection with lesions of the rectum and rectosigmoid, I wonder if the time has not come when radiologists should themselves do a routine digital examination. Pathological museums are full of specimens of lesion gross enough to have been felt readily with the index finger, yet missed by ordinary barium examination and overlooked by a hurried clinician.

Adhesions, especially about the cecum and ascending colon, are extremely difficult to diagnose. Sometimes a cecum, freely mobile under the screen, will be found, at operation, plastered down with adhesion; one had apparently merely moved the bowel plus adhesions up and down on the retroperitoneal layer of fat. Conversely, an immobile cecum does not always show adhesions at operation.

Tuberculosis of the ileocecal region presents no local pathognomonic finding, but evidence of ulceration in that region always suggests the advisability of making a chest roentgenogram; signs of tuberculosis in the latter usually identify the nature of the bowel lesion.

One is impressed with the statement by a clinician of Doctor Taylor's experience, that the common type of colitis presents no demonstrable roentgen changes. This diagnosis seems to be a purely clinical one, having no clear-cut ante- or postmortem pathological findings.

Lastly, non-malignant polyposis is mentioned. This is a rare disorder. Indeed, papillomatosis might be a better name; reserving the term "polyposis" for the diffuse, truly polypoid lesion of the colon which, as far as we know at present, always terminates in carcinoma.

✽

DOCTOR TAYLOR (Closing).—Answering Doctor Bowen's questions: The mobile cecum is frequently associated with pain and tenderness in the right lower quadrant, especially if there is also present a congenital band, which is put on tension when erect, or when the cecum is loaded; or, if there is an adjacent appendix which shows fixation at some point, allowing the cecum to be quite movable, but when erect its normal downward movement results in tension at the point of fixation of the appendix. Certain other types of adhesions also may be connected with symptoms, even though the cecum is quite mobile.

The mobile cecum is ordinarily a part of a general lack of fixation of the abdominal structures, and I cannot say that I have ever noticed any particular relation between this condition and pressure on the duodenum; the duodenum itself, in most patients with a hypermobile cecum, is also quite movable.

As Doctor Snure suggests, a plain scout film of the abdomen is always made prior to the administration of barium for the reasons which he so well states. I have never been able to connect an insufficiency of the ileocecal valve with definite symptoms or pathology. It is a very common finding. We pay no attention to it.

INSULIN FATTENING IN THE AMBULATORY PATIENT*

By H. CLARE SHEPARDSON, M. D.
San Francisco

Discussion by Bernard Smith, M. D., Los Angeles;
Garrett Cheney, M. D., San Francisco; F. M. Pottenger,
Jr., M. D., Monrovia.

IT is generally conceded that obesity is not only an undesirable condition, but actually a menace to health. Thinness, on the other hand, is thought of as an asset, and is usually sought for by the members of both sexes. In general, this attitude is correct, provided the undernourishment is not excessive. Yet malnutrition may be a serious impairment to longevity even in early adult life.

MALNUTRITION AND LONGEVITY

It has been shown, for example, that among men who are over five feet ten inches tall a weight of 20 per cent below the normal increased mortality 30 per cent. If the person is 30 per cent underweight, the figure is 50 per cent. It is probable that the most desirable state of nutrition approximates the so-called normal weight for height, age, and sex, with perhaps a variation of not more than 10 per cent either above or below the standard.

Just as there are many active individuals who eat lightly but nevertheless accumulate fatty tissue,

* Read before the General Medicine Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

so are there relatively inactive persons who eat heartily and yet remain thin. Although the cause of such a chronic state of undernutrition has not as yet been satisfactorily explained, certain associated stigmata are frequently present. These persons are usually lacking in stamina and physical vigor, and become easily fatigued. Often they have narrow, shallow chests, with which is commonly associated a visceroptosis, and poor cardiovascular development. Gastro-intestinal neurosis with its many symptoms, as well as more or less asthenia, may be present. Frequently the problem is one of physical constitutional deficiency rather than actual disease. Most often these patients have consulted many physicians in their efforts to obtain relief from the various complaints, such as indigestion, poor appetite, nervousness, or easy fatigability. Many have been chronically underweight for years and have sought to gain, more or less unsuccessfully, by such measures as forced eating, prolonged vacation, and rest cures.

Prior to the last decade it was almost an insurmountable task to improve the feeling of well-being of this group of individuals. To be sure, rest cures helped, but only temporarily, and other measures were even less efficient, so that physicians eventually came to a feeling of hopelessness in the therapeutic agents available.

USE OF INSULIN IN UNDERNOURISHED INDIVIDUALS

It was, therefore, almost a foregone conclusion that such a potent hormone as insulin has proved to be would eventually be utilized in an effort to improve the physical condition of the chronically undernourished person. And, as a matter of fact, in spite of the favorable results from its use which have been recorded in such widely divergent conditions as cardiac decompensation,¹ scleroderma,² cancer,³ toxemia of pregnancy,⁴ morphinism,⁵ tuberculosis,⁶ peptic ulcer,⁷ rickets,⁸ pellagra,⁹ chronic ulcers and circulatory disturbances of the extremities,¹⁰ insulin appears to have its greatest practical usefulness, aside from the control of diabetes mellitus, in the treatment of nondiabetic malnutrition.

The American pediatrician, Pitfield,¹¹ pioneered the use of insulin in the treatment of inanition. The dosage used by him was extremely low—one unit daily—although apparently definite results were obtained. It remained for Falta¹² to place the insulin treatment of nondiabetic undernourishment on a practical basis. He started his patients on ten units three to five times daily, and increased the dosage to as much as thirty units five times daily with very satisfactory results. Subsequent to the publication of Falta's results, many confirmatory reports of the efficacy of insulin in malnutrition have appeared. No attempt will be made to review the voluminous literature which has accumulated on this subject, for both European and American internists have made use of this substance not only in uncomplicated inanition, but also with those individuals who are underweight as a result of such diseases as tuberculosis, cancer, and hyperthyroidism. Suffice it to say that in reading the literature one is impressed with the

almost universal improvement obtained by this type of therapy. Few authors mention many failures.

HOW INSULIN ACTS IN MALNUTRITION

Originally the use of insulin in malnutrition was undertaken purely as an empirical measure, although its depressing effect on the blood sugar was known. Recent investigations by Okada¹³ have demonstrated that insulin favors the flow of gastric and pancreatic secretion and of bile. But it remained for Quigley, Johnson, and Solomon¹⁴ to explain the marked increase in appetite usually resulting from insulin administration in adequate doses. They showed that subcutaneous injections of insulin in amounts of twelve to twenty units usually produce in normal human subjects, fasting eleven to forty-four hours, an increase in gastric motility. The essential features of this response are an increase in gastric tone and a very prolonged hunger period. Furthermore, the degree of hunger parallels rather closely the degree of gastric motility.

Although these investigations have elevated such use of insulin from an empiricism to one of rational therapy, the exact operative mechanism in cases of malnutrition with intact carbohydrate metabolism is still a matter of speculation. Whether the total glycogen is increased or decreased by the administration of insulin to normals (the literature contains rather contradictory evidence on the point, although MacLeod¹⁵ states that there is an "undoubted decrease in the total glycogen which occurs on injecting insulin into normal animals"), the respiratory quotient is elevated, indicating an increased carbohydrate oxidation. Falta believes that insulin affects not only carbohydrate metabolism, but also general metabolism; and that it accelerates intestinal digestion and absorption. Certainly it is true that an individual can be induced to eat and assimilate a large amount of food, much of which will later be deposited as fat. In order to obtain adequate results it is essential to take the fullest advantage of the hunger engendered by insulin and capitalize on the intense food craving. The quantity of food that an individual can consume and apparently digest is in some instances astounding. Furthermore, the psychic aversion to food frequently encountered in the psychasthenic can usually be overcome, thus bringing about the establishment of better habits of eating as well as an increased ingestion of food. And it is probable that the gain in weight results from this increased intake together with better digestion and an increased assimilation of food, rather than from an altered water metabolism, as has been suggested.

Diabetic edema is not uncommon, but Blotner¹⁶ demonstrated that the relation between fluid intake and output in nondiabetic individuals taking insulin remained unchanged during and after treatment. Furthermore, the occurrence of edema in the nondiabetic has not been reported, and the mere fact that the weight is usually maintained after the omission of insulin contradicts the possibility of a marked water retention. However, for

TABLE 1.—Insulin Fattening

TABLE 1.—Insulin Fattening																					
Case No.	Sex	Age	Ideal Weight	Weight prior to Insulin	Pounds under Weight	Gain in Weight per Week											Total Gain Pounds	Maximum Insulin Dosage	Blood Pressure	Basal Metabolic Rate	Remarks
						1	2	3	4	5	6	7	8	9	10	11			%		
1	F	48	152	108½	43½	109½	111½	111½	112½	113½	114½	...	...	...	Still under treatment	...	45	130/60	1. %+	Reached present dosage February 10, 1933.
2	M	37	164	132½	31½	135½	136½	138½	140½	141½	142½	144½	...	...	145½	...	55	106/68	.4%—	
3	F	39	132	107½	24½	110½	111½	110½	108½	110½	113	113½	Local reactions	104½	...	3	40	130/80	9. %+	Influenza February, 1932, during fourth week.	
4	F	34	145	93	52	95½	94½	95	...	100½	102	...	...	104½	...	9½	60	125/80	0.	Therapy not consistent; many doses omitted.
5	F	31	127	106	21	107½	...	110½	...	...	...	...	...	...	112½	...	25	90/60	12. %—	Severe reactions with larger doses.
6	F	20	130	102½	27½	105½	106½	106½	105½	109½	...	...	110½	...	...	6	55	100/50	4.6%—	Therapy not consistent.
7	F	35	135	107½	27½	...	110	113½	...	114½	...	117½	...	Still under treatment	...	20	120/78	6.3%—			
8	F	33	127	92½	24½	94½	98	...	...	...	...	...	...	...	...	5½	30	110/70	2.3%+	
9	M	17	118	88	30	...	...	...	...	93½	...	...	...	96	...	10½	64	94/50	13.9%+	Still under treatment.
10	M	43	200	160½	33½	...	...	...	168½	...	...	...	171½	...	...	5	40	110/68	8.8%+	
11	F	34	138	105½	32½	...	...	...	110½	...	...	112½	Local reactions	113	...	7½	40	110/60	17. %+	
12	F	22	141	102½	38½	104½	106½	107½	(1) 114½	(2) 114½	(3) 115½	(4) 115½	(5) 118½	(6) 119½	(7) 119½	...	...	104/60	.1%+	Probably longest continuous injections of insulin on record. February 4, 1932, to date.
13	F	27	133	115½	17½	...	...	...	119½	...	...	...	...	...	...	4	40	100/70	5.3%—	
14	F	32	122	93½	28½	...	...	...	94½	...	101½	Completed by tbc.	...	...	...	8	60	110/76	11.7%+	
15	M	12	76	60½	9½	67	...	69½	71½	...	...	...	...	...	...	5½	45	90/68	16.7%+	
16	F	34	137	102½	34½	107½	106½	...	113	...	...	...	118½	...	...	16	60	104/60	1.9%—	
17	M	44	162	126½	35½	128½	131½	...	...	General reactions.	...	...	...	...	...	4½	35	100/60	Not done	

a concise review of the various theories regarding the mechanism involved in the increasing of weight by insulin administration the monograph by Frank and Wagner¹⁷ should be consulted.

INSULIN TREATMENT AND HOSPITALIZATION

While a majority of the patients on whom this type of treatment has been utilized, especially by the earlier workers, were under rigid institutional supervision, hospitalization is quite unnecessary. Nichol¹⁸ has recently reported the late results in sixty-three patients, fifty of whom were ambulatory. No ill effects have been apparent, and it is unlikely that there is any real risk involved except possibly where actual heart disease exists. Electrocardiographic studies by Middleton and Oatway¹⁹ demonstrated a decrease in height of the T-wave in all three leads with less marked changes in other components, with insulin reactions; so that in the presence of myocardial injury insulin shock might result in definite damage. Consequently, it would be ill advised to attempt the administration of insulin to patients with obvious cardiac disease, or to elderly patients in whom depression of the blood sugar would in all probability result in impaired nourishment to the myocardial musculature.

AMBULATORY PATIENTS SELECTED FOR THIS STUDY

The results of this series of seventeen unselected cases, all of whom were ambulatory and whose ages varied from twelve to forty-eight years, are given primarily to show that, if proper cooperation be obtained from the patient, increase in weight usually results. Secondly, however, there are included in this series several individuals in whom are typified the chief reasons for failure. Finally, the report of one patient is included who has received three injections of insulin daily for fourteen months. Nowhere in the literature have I found reference to a case in which a nondiabetic patient has received insulin for this length of time.

The immediate effects of treatment can be summarized as follows:

1. Definite sharpening of the appetite;
2. Increase in the feeling of well-being;
3. Increase in weight;
4. Improved strength;
5. Improved tissue turgor;
6. Better gastro-intestinal function.

Any ill effects which may ensue are manifested quite early. They are usually confined to marked local reactions or severe general reactions.

The incidence of local skin hypersensitiveness is high as compared with its relative rarity in patients with diabetes mellitus. Blotner reported its occurrence in six of nineteen patients, although Nichol had only three cases in his much larger series. These local reactions, which occur as urticarial weals about the site of injection, may be extremely aggravating and quite painful. They frequently persist for several hours, and sometimes are of sufficient intensity to warrant discontinuing treatment. Tuft²⁰ feels that a reaction such as this to insulin is not necessarily a specific hypersensitiveness to insulin protein, but rather is dependent on some irritant quality of the particular preparation used. That this effect can sometimes be avoided by changing either the brand of insulin or the type of insulin used (the insulin usually obtained is prepared from hog pancreas, but beef insulin is available), is demonstrated by Case No. 1 in this series where from one preparation of insulin the patient developed extremely painful reactions which ceased as soon as another preparation was substituted. Usually, however, as Blotner points out, persons who become sensitive remain so to all brands, suggesting an actual sensitivity to insulin protein.

For some reason not entirely explained, general reactions may be quite severe in spite of the fact that the patient takes ample food, and that the blood sugar does not sink to a level usually considered necessary for hypoglycemic reactions. These occurred in our Case No. 12—although they were finally overcome—and in Case No. 16. In the latter instance they were so severe that it was necessary to abandon treatment. The patient in Case No. 5 developed severe reactions while taking fifty units of insulin daily. These persisted for several days after insulin had been omitted, and in spite of a blood sugar of 129 milligrams per cent. Insulin was subsequently resumed in smaller doses without uncomfortable effects.

All of the patients included in this report have been tall, slender, more or less asthenic individuals. Most of them have made numerous attempts to gain weight without permanent results. Under insulin therapy none of them failed to gain, and in those cases in which recent reports have been obtained the added weight has been for the most part maintained. At first glance it would seem that the increase in weight is not sufficiently marked to compensate for the discomfiture and trouble involved. It should be emphasized that these patients are all quite thin; consequently the addition of even a few pounds is exceedingly wel-

come. The maximum gain observed occurred with patient No. 12, whose weight increased from 102½ to 119½ pounds on forty-five units of insulin daily, although several of the patients, as is indicated on the chart, are still under treatment. One patient voluntarily discontinued treatment after two weeks, during which she gained three and one-half pounds. Subsequent reports on her condition have not been received.

PROCEDURE WHICH WAS FOLLOWED

The procedure utilized in this work has been as follows:

A glucose tolerance curve was done on the patient to be certain that, following the stimulation of the pancreas by carbohydrates, the blood sugar did not normally reach an unusually low level. If the curve was satisfactory, insulin was begun by giving five units before the heaviest meal of the day. If no reactions ensued and no intolerance became apparent, the dosage was increased every other day by five units given before one of the other meals. Unless it was not practical for the patient to take insulin before all three meals (and it was inconvenient for some, especially office workers, to take insulin before lunch), an attempt was made to give twenty units approximately half an hour before the three main meals. Each patient was cautioned regarding insulin reactions, and definitely advised to carry sugar *at all times*. An occasional patient found it impossible to take twenty units before breakfast because of the occurrence of marked reactions about 11:30 a. m. The dosage in these instances was reduced to a point where no reactions were felt. Treatment was discontinued if intolerance became manifest or when weight gain ceased.

COMMENT

In this series the dosage varied from twenty to sixty-four units daily, and it is quite probable that additional insulin could be given if necessary. Analysis of the occasional inadequate results reported indicates the failure to be due, in most instances, principally to the administration of an insufficient amount of insulin. The quantity given must be increased to the point where the physiologic effects are manifest. But because of the variation in tolerance, adequate doses should be approached cautiously. For example, one patient (Case No. 7) obtains a tremendous stimulation of appetite on ten units twice daily, but will develop rather severe general reactions if a greater amount is administered. On the other hand, a boy, aged seventeen (Case No. 9), takes thirty-two units *one hour* before breakfast and an equal dose one hour before dinner, and yet must exercise rather strenuously before eating to obtain any appreciable increase in appetite. Without the exercise three or four hours might elapse before obvious increase in hunger occurs. He has never experienced any symptoms suggestive of hypoglycemia.

Excluding the occurrence of reactions, either local or general, of sufficient intensity to necessitate discontinuing the use of insulin, the only apparent cause of failure results from the in-

convenience experienced by the patient. Most of the individuals are of the asthenic type and are easily discouraged. It must be admitted that there is some doubt as to whether the discomfort, as well as the cost of treatment, are always actually worth while. Certainly a fair proportion of this group cannot or will not tolerate two or three injections daily, and unless marked hunger is produced prior to at least two meals daily, very little increase in weight will be obtained. Even though definite results may be apparent very early, within a week, this indisposition on the part of the patient may persist. On the other hand, provided adequate amounts of insulin are administered, an increase in weight can be produced almost uniformly. Apparently no complicating disease (excluding cardiac pathology) contraindicates its usage. The literature is replete with references to the use of insulin in increasing the weight of individuals suffering from tuberculosis, cancer, hyperthyroidism and other debilitating diseases.

It should not be implied that the increase in weight is unlimited. The largest increment of increase occurs in the first two or three weeks of treatment after the maximum dosage has been established. Subsequent gain is slow, as is evidenced by Case No. 12 in the present series. This girl gained eight pounds in the first two months of treatment. During the ensuing year an increase of only nine pounds has been apparent. She is still about twenty pounds under her ideal weight. There are, however, apparently two types of weight increase as reported by various writers. In one group the gain is rapid and fairly continuous throughout the period of insulin therapy and, in a few instances, continued after the omission of insulin. In the other group, gain in weight is rapid at the beginning of insulin therapy, becomes less marked as time goes on and finally the weight becomes stationary, whether or not insulin is taken. No instance has been reported in which the weight of a person taking insulin has increased beyond the normal, and usually the gain ceases while the patient is still definitely below the ideal. Even so, the general improvement noticed by the patient commonly compensates for the inconvenience, for ordinarily the increase in weight is accompanied by a marked improvement in the feeling of well-being. The skin acquires a healthier color and turgor, the nervous system becomes more stable, and there is an increased strength and vigor. Insulin serves as an admirable tonic, both physiologically and psychologically, and is of definite value in the management of cases in which it is desirable to bring about a gain in weight. It is rational, simple and safe.

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DISCUSSION

BERTNARD SMITH, M.D. (710 Wilshire Boulevard, Los Angeles).—The use of insulin in the treatment of cases of chronic malnutrition is frequently of definite help, and reported results are sufficiently encouraging to justify warnings that the method may not be without danger. Induced hypoglycemia, or even too rapid a fall in the condition of hyperglycemia, may be the cause of serious cardiovascular damage to the adult diabetic. There is no proof that the adult non-diabetic cannot be harmed in the same way.

Patients must be selected for insulin therapy with the greatest care. Doctor Shepardson has used the glucose tolerance test as a routine measure before permitting insulin to be used. He has had the dangers of the method in mind in interpreting the tolerance curves in regard to a low blood sugar response. When there appears the possible picture of rapid disappearance of glucose from the blood stream, additional information may often be obtained by watching the blood sugar response to a heavy mixed meal.

The adult, even in the third decade of age, with poor general nutrition, carries the circulatory picture of the associated asthenia. Here it is of great importance that all information possible be obtained in the early period of treatment regarding the individual reaction to insulin as it affects a circulatory mechanism that is chronically subnormal. If feedings cannot be given at such frequent periods as to maintain the blood sugar at a constant level of the individual physiologic requirement, there is danger of cardiac or circulatory damage, even when blood sugar readings may show values within the range of the textbook normal. This has been guarded against by Doctor Shepardson by beginning with an insulin dosage of small unit value. Unless the physician is thoroughly familiar with the circulatory changes that may be the result of an induced lowering of blood sugar, too great caution cannot be used in the selection of cases for this form of treatment. When ambulatory treatment is necessary, the responsibility of the physician is greatly increased and must be realized.

Doctor Shepardson is to be congratulated on the intelligent cooperation he has had from this group of patients. It is largely due to painstaking instruction of the patient in as careful detail as is required in successful diabetic teaching.

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GARNETT CHENEY, M. D. (210 Post Street, San Francisco).—Doctor Shepardson deserves a great deal of credit for calling our attention to the insulin treatment of underweight patients who are ambulatory. This subject should receive a much wider consideration in general practice than it has hitherto enjoyed. In my experience in treating about twenty-five patients, only three failed to receive marked benefit, and none were hospitalized for the course of injections.

Actually, the gain in weight is of secondary importance to the sense of well-being and increase in energy which occurs. Doctor Shepardson's patients, under his plan of treatment, have gained more slowly than with the plan I have followed. Patients under treatment receive a test dose of five units twice the first day, and ten units twice the second day, and then start a regular dose of twenty units two or three times a day for three weeks. All of the patients carrying out this plan have gained from eight to fourteen pounds within this period of time, the average being about ten pounds. In a few instances the individual dose was raised to twenty-four units, and in a few instances the treatment was continued for a longer period of time as a greater weight gain was desired. One patient increased the dose to thirty-two units three times a day, and gained a total of seventeen pounds in ten weeks.

In general the rapidity of weight gain is in proportion to the dosage, in that doses above fifteen units practically always create a very strong desire for food, resulting in an increased intake and increased metabolism. Small doses are of little value in putting weight on most patients. All patients are instructed from the very beginning to take extra carbohydrate feedings two hours after each meal which has been preceded by an insulin injection, and thus hypoglycemic reactions which occur earlier than in diabetes are prevented. One patient has been observed who was skin-sensitive to all forms of insulin.

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F. M. POTTINGER, JR., M. D. (Pottenger Sanatorium, Monrovia).—I wish to speak particularly of the sensitivities mentioned by Doctor Shepardson. In our use of insulin for increasing the weight of patients, we have noted reactions of varying degrees of severity in fourteen of nineteen tuberculous, and two of seven nontuberculous patients. Of these reactions, twelve were at the site of inoculation; three generalized urticaria; and three consisted of tissue absorption following the outline of muscles.

We have accounted for these reactions as probably being due to lack of available carbohydrate. Many patients with tuberculosis do not handle carbohydrates

well. Of all the sugars we have tried, lactose seems to be best tolerated.

By injecting glucose solution with the insulin, focal reactions were lessened. Urticarias were treated by intravenous glucose, and the tissue absorptions responded to forced feeding of carbohydrate, particularly lactose.

Pulmonary improvement was noted in most of the patients. We believe that insulin is a valuable adjunct in the treatment of malnutrition of patients suffering from chronic tuberculosis; but during such treatment a high carbohydrate intake should be maintained.

CHRONIC CARBON MONOXID POISONING— A PRESENT DAY HAZARD*

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DISCUSSION by C. L. Connor, M. D., San Francisco;
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THE study[†] here presented includes, in rather condensed form, the results of various experiments conducted on chronic carbon monoxid poisoning since 1929. Detailed description of the various pathologic lesions found in animals cannot be included in such a short paper; but in order to visualize the clinical findings more clearly, the essential points only may be listed. All changes are based on vascular degeneration due to anoxemia, with resultant parenchymatous degeneration. Bilateral softening of the basal ganglia, degeneration of the ectomesodermic barrier, edema of the brain and degeneration of peripheral nerves occur. Other organs show a myocardial degeneration, pulmonary congestion with localized hemorrhages, parenchymatous degeneration of the liver and degeneration of skeletal muscles. As a matter of fact, no tissue or organ is immune, hence the bizarre picture we sometimes see. With elimination of the gas, restitution of tissues is surprisingly active, so anatomical and physiological function may be restored.

Acute poisoning has been mentioned in Roman and ancient Greek literature¹ as a means of torture, suicide or accidental death, but chronic poisoning was not brought to the attention of the medical or lay public until 1869 when Moreau² described the symptoms. He termed it the "insanity of cooks" and ascribed it to working over poorly ventilated stoves. Since that time data have been slowly accumulating in the medical literature, and much has been written on the diagnosis and treatment, especially by Henderson³ and Haggard⁴ in the last few years. The increasing

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importance of this gas has been largely in response to the great strides and development of the manufacturing industries, together with the repercussions of this development—gasoline motors, automobiles and the complexities of aviation.

SOURCES AND CHEMISTRY OF THE GAS

Carbon monoxid is a tasteless, odorless, non-irritating gas containing 42.87 per cent carbon and 57.13 per cent oxygen. Wherever combustion occurs, carbon monoxid becomes a potential hazard, for it is produced as a result of incomplete combustion of carbon in the presence of an insufficiency of oxygen. It is not a true poison, but acts rather as an inert gas by diminishing the oxygen carrying capacity, causing an anoxemia and the formation of carbon monoxid hemoglobin. Carbon monoxid has an affinity for hemoglobin 300 times greater than oxygen, therefore it easily replaces this element after a brief exposure. Cerebral symptoms occur when one-fifth of the hemoglobin is taken up, while death may be expected if two-thirds is rendered unusable. In this paper carbon monoxid is to be expressed in the human body by percentage of hemoglobin saturation, while in the air it will be indicated by parts per 10,000 parts of air.

TOBACCO SMOKE

Sayers,⁶ Hamilton⁶ and others have very excellently covered most of the manufacturing hazards experienced in carbon monoxid poisoning in the several federal government and state bulletins. In unearthing the various hazards which may hold some danger for the average individual leading an ordinary life, the first common exposure is the smoking room. Jones⁷ and Armstrong⁸ have made experimental studies in this latter field and have found that incomplete combustion of tobacco results in the production of carbon monoxid. In my work I have found that in an unventilated room 8 by 10 by 12 feet one person may, by continuous smoking, develop rather high concentrations of the gas. Using cigarettes, pipe and cigars in that order in different experiments, the following concentrations were obtained: at the end of one hour, 0.5, 0.5 and 1.1 parts of carbon monoxid with a blood saturation of 0. At the end of two hours the figures were 2.0, 2.5 and 2.9 parts per 10,000 parts of air with a blood saturation of 2.3 per cent, 4.0 per cent and 5.0 per cent. At the end of three and one-half hours the figures were 4.0, 4.5 and 6 parts per 10,000 parts of air, with a blood saturation of 5.0 per cent, 6.5 per cent and 10 per cent. These results were all obtained in a room with practically no aeration, and cannot be cited as representative of the average smoking room where adequate ventilation prevails.

GARAGE WORKERS

In a series of 100 garage workers examined, 15 per cent of the men showed positive blood findings. The concentration of the blood slightly past mid-day, when the temperature was the highest and the workers the busiest, ranged from 8 per cent to 12 per cent saturation. Most of these men

were underweight, had pale, sallow complexions and complained of vague gastro-intestinal symptoms and lassitude.

STREET TRAFFIC

Casual pedestrians or those people traveling through the streets in various forms of transportation are probably not subject to any high or dangerous blood saturation. The problem rather is found in the study of people who spend a large part of their waking hours in the streets, such as traffic officers, street cleaners, taxi drivers and news sellers. I have followed for great lengths of time in the wake of large urban transportation buses and found that when they stop at intersections the surrounding air takes on a temporary but definitely high concentration of carbon monoxid. As newspaper sellers are located principally at these intersections, many were examined for blood saturation. At the height of evening traffic, twelve of the twenty-five persons examined showed blood saturations from 2 per cent to 4 per cent—safe for short exposures, but certainly of potential danger over many years' absorption.

FERRY TRAFFIC

Further investigation was carried on to determine any possible danger arising in ferry transportation. The average automobile ferry crossing San Francisco Bay has a capacity of approximately eighty or ninety cars. Estimating that motors are running for a period of at least six minutes during the unloading, nearly 1,000 cubic feet of carbon monoxid are produced each time the ferry discharges its load. For a brief time the air concentration goes as high as five parts, especially near the center of the boat. As the majority of the crew is forward directing traffic and exposed to the fresh air, this fortunately has not resulted in an industrial hazard. The time limit of exposure of the passengers, also, is so brief that no blood absorption was demonstrated.

AVIATION

The hazards of carbon monoxid in aviation are still under investigation. In this country Lieutenant Commander Joel J. White⁹ of the Medical Corps, United States Navy, has made numerous studies of naval planes of various types and showed carbon monoxid to be a definite source of danger, in many cases to both the pilot and passenger. The greatest hazards in aviation probably exist in the low grade poisoning when the pilot is not aware of any definite ailment, but suffers an impairment of health with a decrease in efficiency, and is therefore subject to possible accident. Most of the present day planes are propelled by one, two, three or more motors of the radial type, usually of nine cylinders each. Several types of exhaust disposal are employed, ranging from the single tube about twenty-four inches long for each cylinder to the more complex circular collecting rings. In the former, the exhaust pipes end abruptly slightly in front of the cockpits, and hence are potential hazards by blowing quantities of exhaust gas back past the passenger or pilot.

In the latter type, the various cylinders are connected with one or more collecting rings by flexible tubing or slip-joints. Provided there is no leakage at these points, there is very little chance for carbon monoxid to become dangerous, as the exhaust gas is brought down beneath the fuselage and is there permitted to escape. Until recently these collecting rings were constructed of ordinary steel and were sometimes subject to burning by heat from the motor. The usual method of heating planes at the present time is based on a device composed of a metal collar surrounding the collecting ring, and allowing the outlet of air from the collar thus heated by the exhaust pipes to heat the cockpits or cabins. Accidents and several near fatalities have occurred through the steel collecting rings burning and permitting the escape of carbon monoxid from the exhaust into the pilot seat or cabin. Until recently, therefore, passengers had no assurance that they would not be overcome by escaping exhaust fumes, but the more progressive companies have within the past few months replaced the obsolete type of collecting rings by more efficient ones constructed of stainless steel which can stand very high temperatures without destruction. In addition to this, more rigid examination of the slip joints for possible exhaust leaks has been instituted. The possibilities of poisoning of pilot or passenger in such more modern planes is indeed small.

At the present time many of the open cockpit planes employing the simple exhaust pipe for each cylinder are definitely classed as hazards; and no wonder: consider that large quantities of carbon monoxid are blown back toward the cockpits. This gas follows the air currents or slip stream generated by the revolving propellor, and small but definite quantities are sent around the right side of the fuselage, following an arc, and up on the opposite side. A probable suction action is created by the cockpits, and air containing carbon monoxid is attracted. Samples of air secured at many locations showed concentrations of gas as high as five and six parts per 10,000 at various points along the pathway taken by the air currents. Concentrations in the cockpits were greatest near the floor levels, and reached as high as three parts per 10,000 parts of air. At the level of the nose of pilot or passenger this percentage is naturally dissipated by cross currents of air, but blood saturations as high as eight per cent were observed after four hours of flight.

The recommendations made here are that all planes should employ collecting rings, and if heating units are installed, the plane should be equipped with stainless steel collecting rings and heating collars, or that water type heating be used.

VEHICULAR TUBES

The Posey Vehicular Tube is a common thoroughfare under the Oakland Estuary between Oakland and Alameda, and is manned by a superintendent and crew of fifteen men. It is 4,500 feet in length, thirty-seven feet in diameter, and is forty feet under water at low tide. At each end of the tube are eight large ventilating fans, four in-

take and four exhaust, with a maximum capacity of blowing 1,000,000 cubic feet of fresh air per minute and eliminating the same amount of waste air. During the crowded hours of traffic as many as 1,000 automobiles pass through the tube each way per hour. The ordinary composition of exhaust gas from automobiles consists of carbon monoxid 7 per cent, carbon dioxid 7 per cent, oxygen 1.5 per cent, nitrogen 80 per cent, benzol 3.2 per cent and illuminants 0.3 per cent. The average automobile is rated at forty horsepower, and each motor will produce two cubic feet per minute. In one hour, then, as high as 240,000 cubic feet of carbon monoxid are given off. The ventilating system, however, has been so efficient that the content of gas has been maintained at or below two parts per 10,000 parts of air, with approximately one-half of the fans in reserve.

Despite these low figures, after many months' employment, several of the maintenance men became aware of a train of symptoms which brought them independently to their private physicians. The officials of the tube, alarmed by the condition of the employees, asked for a medical survey, with establishment, if possible, of a diagnosis.

CLINICAL STUDIES

Symptomatically the men complained of frequent temporal headaches, dyspnea and slight palpitation on exertion, weakness, easy fatigue, anorexia and nervousness. Two of the men, both under 40, claimed impotence. Objectively, they presented loss of weight, pallor, hypotension with blood pressures reaching as low as 90/60; conjunctivitis, congestion of retinal vessels by bright red blood, pulmonary congestion and occasional tremors of the hands. Laboratory findings may be summarized as follows: Polycythemia, with red cell counts as high as 6,000,000, glycosuria occasionally and slight shift of the blood toward the alkaline with carbon dioxid combining power readings from 58 to 65. At first spectroscopic examination of the blood was employed with unsatisfactory results. Subsequently chemical analyses were used, and concentrations of carbon monoxid of five per cent to ten per cent were found.

These men served as an excellent group to trace the clinical findings of chronic carbon monoxid poisoning. Records of physical examinations before employment disclosed them to be free from any suggestive symptoms. They have been followed throughout their trouble to the present time, over a period of approximately four years. After the diagnosis was established it was obvious that improved conditions must be attained. Air-tight cubicles, largely of glass, were constructed within the tube to house the men while on duty, and into these rooms a steady stream of pure fresh air from the outside is blown. Working within these small compartments, the men steadily improved and at the present time are free from any symptoms of carbon monoxid poisoning. This not only resulted in removing a severe industrial hazard, but made it needless to increase the ventilating system, saving the county several thousands of dollars yearly in electrical consumption.

CONCLUSIONS

1. The essential pathologic changes, clinical and laboratory findings of chronic carbon monoxid poisoning are given.

2. Many of the hazards of every day life are studied, including smoking rooms, street traffic, ferry boats, garages, aviation and vehicular tubes.

3. Elimination of hazards and the improvement of working or living conditions are the recommended means of combating this condition.

4. Chronic carbon monoxid poisoning should be considered in many obscure illnesses.

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DISCUSSION

C. L. CONNOR, M. D. (University of California Medical School, San Francisco).—It is becoming more and more important to recognize chronic conditions which do not present outstanding symptoms. Classic descriptions of disease usually refer to practically a terminal stage, at which time little or nothing may be done for the patient. Doctor Michael has presented a clinical picture which appears to be fairly characteristic, but which certainly might be confused with the early stages of other diseases. A simple method of examining the blood for carbon monoxid now makes the diagnosis of chronic poisoning by this substance certain. Therefore, in addition to presenting an increasingly important present-day hazard, Doctor Michael's paper indicates the trend which scientific medicine must take—that is, the recognition of diseases in their early phases so that prompt measures may be taken to prevent or cure them. It is important to note that severe nerve cell degenerations, following severe carbon monoxid poisoning, are irreversible, and that a very acute poisoning by this substance may result in chronic invalidism should the patient recover.

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GERTRUDE MOORE, M. D. (2404 Broadway, Oakland). The consideration of this subject is timely indeed, for carbon monoxid exacts a death toll greater than all other gases combined, and twice that of typhoid fever.

The author's recommendation regarding the disposal of exhaust fumes from aeroplane engines is important, and as illustrating this, we are reminded of an incident in which a near-fatality occurred to two officers in the Army Air Corps while photographing the city of Chicago. A break in the exhaust line leading through the heater-jacket allowed exhaust fumes to enter the plane in sufficient quantity to overcome the pilot. The photographer, noting the plane diving at a terrific speed, went forward and found the pilot slumped over, unconscious, with his shoulder pressing the stick. By an almost superhuman effort he was

able to right the plane and safely land. Such dangers as these are the result of acute carbon monoxid poison; but, while not as spectacular, the dangers of chronic poisoning are just as real, and there is, as the essayist indicates, a great need of additional investigation to determine the deleterious effects on health resulting from prolonged exposure to small concentrations of carbon monoxid. There is no known poison which has so varied and so widespread an effect and, as Doctor Michael has shown, its frequency in every walk of life today makes it an ever-present menace not only in motor cars, aeroplanes, motor boats, and many of the ordinary occupations, but even in the home where gas appliances are used for cooking and heating, and incomplete oxidation is not at all uncommon. An interesting finding in this connection is reported by Hamilton, who studied four hundred workers of the same age and nationality in South Chicago, one-half of whom were steel workers exposed to constant small doses of carbon monoxid, and the other half were workers with no possible contact. Those who had not been exposed showed an average of 24 per cent greater muscle power than those who had been exposed.

The whole problem has an interesting relation to industrial insurance. It is not at all unusual for a gassed patient to recover consciousness and for a short period to return to apparently normal health, only to have the symptoms reappear and insanity or death result. In these cases there is always a serious question regarding compensation, the solution of which is put squarely up to the medical man.

So let us keep this constantly in mind in all obscure conditions, especially those cases in which neurologic symptoms are present; remembering, however, that the diagnosis of chronic carbon monoxid poisoning should never be made in the absence of a history of exposure to this gas.

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ROBERT T. LEGGE, M. D. (University of California Infirmary, Berkeley).—The general public, the miner, the industrial worker, and the housewife especially, should be interested in carbon monoxid poisoning, as it is the most widespread and toxic agent of modern civilization. Certainly it is good preventive medicine to continually campaign through education, and by the institution of safety measures against the dangers of this deadly gas. The scientists have developed accurate methods for its detection in the blood and atmosphere. The pathology is well understood, and efficient therapeutical measures have been devised.

Every physician should heed the immortal words of advice that Ramazzini offered to his students in taking histories for diagnosis—"What is your occupation?" This is a most important question which may often elucidate the cause of many obscure symptoms resulting from an occupational disease.

Chronic carbon monoxid poisoning, as pointed out by Doctor Michael in his paper, is a hazard that requires our earnest attention. Suspicion should be aroused when any worker or domestic who breathes an atmosphere wherein carbon monoxid is disseminated, complains of headache, namely, those in such occupations as cooks, ironers, garage men, linotypers, pressers in tailor shops, gas and smelter employees, etc. Nausea, dizziness, or weakness in the lower extremities is often prevalent in the first stages of chronic poisoning. Eventually the question is raised: What is the ultimate result of such an exposure to these workers—traffic officers, street vendors, the public in garages, in vehicular tunnels, and other closed quarters? It is important to note that the greatest changes in the tissues found at postmortem are those of extensive fatty degeneration of the heart, kidney, wall of blood vessels and other tissues. This fact may explain the increase of cardiac diseases noted in mortality statistics. It is well known that housewives and female cooks suffer greatly from nervousness. The increase in psychopathic conditions should also be studied to ascertain whether, in addition to other obscure illnesses, this etiology is also chargeable to this deadly gas.

PERINEAL REPAIR*

A NEW METHOD

By HARRY S. FIST, M. D.
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THE levator ani is a compound muscle, the two sides of which are separated by a slit in which lie the vagina, urethra, and rectum. The pubococcygeus fibers, which provide much of the perineal support, extend from the pubes to the coccyx on either side of the midline, and are held together in the perineal body by involuntary muscle fibers.¹ During every delivery, the transversus perinei and pubococcygeus fibers linking them are torn apart; so that, unless the perineum be repaired, some dysfunction follows.

When mucous membranes are intact, and there is no immediate marked deformity to bring the laceration to one's attention, repair is neglected and often, months later, the patient suffers from several of a great variety of symptoms, the result of gaping vulva, subinvolution, rectocele, displacement and pelvic circulatory disturbances. Palpation reveals a thin perineal body containing merely skin and mucous membrane instead of firm, solid muscle fibers. Every labor causes some degree of perineal injury and should be followed by careful examination and repair.^{2,3}

USUAL REPAIR

When a perineal laceration is of sufficient extent to bring it to the attention of the attending obstetrician, repair is done before the patient leaves the table, or after an interval of several days. As a rule, the vaginal mucous membrane is opened, exposing the levator fibers, which are sutured under direct vision. Opening the mucous membrane exposes underlying tissue to the possibility of infection. When infection occurs, the repair breaks down. This is the reason why many obstetricians postpone perineal repair till a fortnight after delivery, when edema has subsided and infection is less probable; but this delay subjects the long-suffering patient to another anesthesia and operation.

The essential part of a perineal repair is not the area of denudation or the method of mucosa closure. Support depends on coaptation of muscles and of fascia. The separated levator portions, particularly the pubococcygeus fibers, must be firmly united anterior to the rectum.

METHOD OF IMMEDIATE REPAIR

About five years ago, in order to repair laceration of slight degree, or separation of the levators, the author devised a simple technique which brings perineal muscle and fascia together in front of the rectum by means of interrupted, buried, submucous, mattress, catgut sutures. Incision of the mucosa is not necessary. This simple, safe procedure, is especially advisable when assistance is scarce and sterilization uncertain. The materials

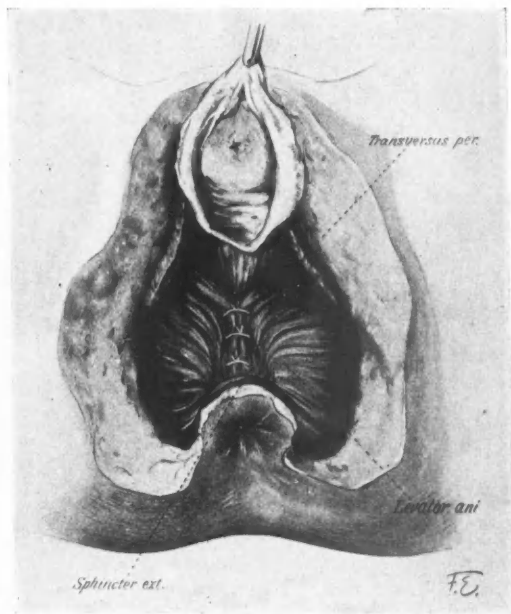


Fig. 1.—From Doederlein Kroenig (Operative Gynecology). Essential step of perineal repair. (Levator fibers united in front of the rectum.)

needed are: a strong, curved, noncutting needle (about the degree of curve of half a dollar), half-lengths of No. 2 chromic twenty-day catgut, a pair of thumb forceps, scissors, needle holder, and perineal retractor. A knowledge of the anatomy of the perineum is, of course, essential.

PREPARATION

With the newly delivered mother in the dorsal position, thighs extended, under anesthesia, cleanse the vulva and vagina, using any standard technique. Redrape the patient. Having finished with the cervix (which should be inspected after each labor and repaired if lacerated), place a gauze pack in the vagina to keep the field clear of blood. Perineal sutures may be inserted while waiting for separation of the placenta, but should not be tied before the uterus is emptied. The first suture is placed high in the vagina to catch the high levator fibers, and each succeeding suture is a little lower.

SUBMUCOUS SUTURES

Anyone with a knowledge of the anatomy of the perineum can insert a needle and suture so as to catch the levator fibers. In order to do this without incision of mucous membrane, the needle is reinserted each time at its point of exit, leaving only a puncture in the mucosa. The needle is brought to any desired location by moving it just under the mucous surface. Thus, when it is tied, the suture includes no mucous membrane. The repair is done as follows:

Retract the right vulvar tissues. Insert the needle on the left side of the vagina; sweep its point well laterally and posteriorly toward the spine of the ischium to secure a good wide bite

* Read before the Los Angeles Obstetrical and Gynecological Society, October 11, 1932.

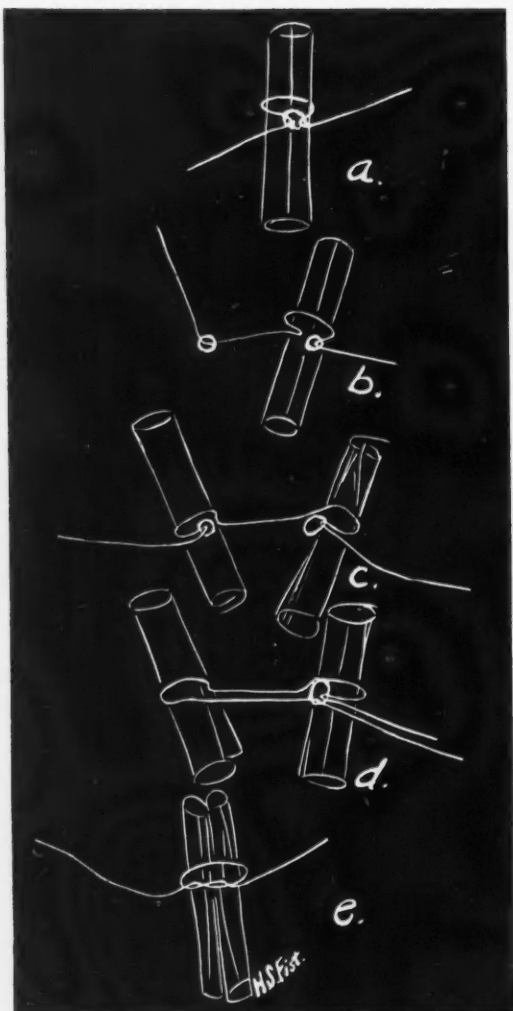


Fig. 2.—Diagram of insertion of sutures: (a) Suture encircles left levator bundle. (b) Needle inserted just under mucosa at point of last exit, brought across to right of vagina, and out. (c) Needle inserted at point of exit and made to encircle right levator, then out. (d) Needle inserted at last point of exit and brought across, just under mucosa, to point of original entrance, and out. (e) Tying suture unites the muscle bundles.

of the left levator ani fibers (principally pubococcygeus); then, carefully avoiding the rectum, bring the needle medially and finally anteriorly, out through the mucosa (Fig. 2, a). Reinsert the needle at the hole made by its exit; keep the point just under the mucosa and bring it across to the right side of the vagina and out (Fig. 2, b; Fig. 3). Reinsert the needle at the point of its exit, directing it laterally and posteriorly, then medially and anteriorly, to encircle the right levator fibers (avoiding the rectum); and again bring the needle out through the mucosa (Fig. 2, c). The suture now encircles levator fibers on each side of the vagina. Insert the needle at its last point of exit; keep it just under the mucosa, and bring it back across the vagina to the first point of insertion, and

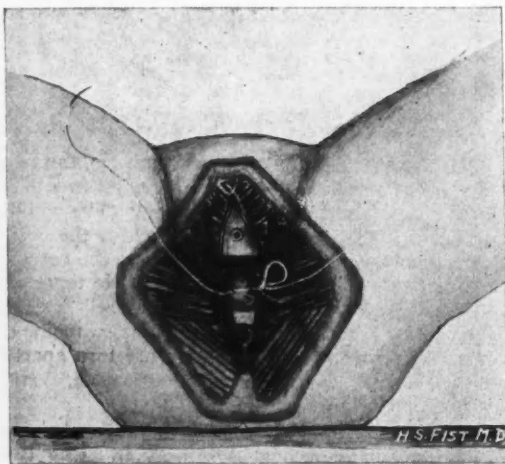


Fig. 3.—The left levator fibers have been caught, the needle brought out, and reinserted at the place of exit. The suture is now being pulled across just under the mucosa, after which the needle will be reinserted at the last point of exit, and caused to encircle the right levator fibers. It may then be brought back, keeping just under the mucous membrane, and out at the original point of insertion, when the two ends may be tied.

out (Fig. 2, d). The suture ends have now been brought together. Holding them taut with a hemostat, to keep the levator fibers together, simplifies insertion of the next suture. Use enough sutures to hold the levator fibers in good apposition. Before tying the sutures, relax the perineum by removing the vaginal pack and retractor and further extending the thighs. Insert a finger into the rectum to feel for sutures and remove any suture which has penetrated. Tie from above downward, snugly enough to coapt muscle, also fascia, but do not pull tightly, or the sutures will cut through when the usual postpartum edema ensues. The levator fibers of both sides are thus brought together between the rectum and vagina (Fig. 2, e). Cut the suture ends at least one-quarter inch from the knot. After completing the repair, palpate the perineum to make certain that the united levator fibers may be felt as a firm, thick mass of muscle.

WHEN MUCOSA IS LACERATED

When the mucous membrane is torn, or after episiotomy, repair is completed in much the manner described above except that the muscles may be more easily reached through mucosal openings. When the muscles have been sutured, the mucosa may be closed by the usual means.

RESULTS

This repair technique is recommended as routine treatment for every relaxed postpartum perineum which does not require open repair. Remarkably good results often follow the insertion of a single suture. This method as used by the author, has yielded uniformly satisfactory support. Repair has been made feasible when, because of lack of assistance or asepsis, other methods would not have been satisfactory. No case of perineal infection has developed, nor have the sutures

ever failed to hold. As a rule, patients have experienced very little perineal tenderness during the puerperium.

SUMMARY

Open repair of the perineum is the usual procedure, and is the method of choice for severe laceration or deep sulcus tears.

For slight laceration or postpartum relaxation of the perineum, the author recommends routine repair by means of immediate, interrupted, buried, mattress sutures approximating the levator fibers anterior to the rectum. This simple, easy method provides excellent support and minimizes the danger of infection.

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SURGERY IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

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AND

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DISCUSSION by Harold Brunn, M. D., San Francisco; William C. Voorsanger, M. D., San Francisco; William Lister Rogers, M. D., San Francisco; Esther Rosencrantz, M. D., San Francisco.

SURGERY in pulmonary tuberculosis has reached the stage in which the patient has heard of its value and occasionally requests or suggests its application even before the attending physician. It, therefore, behooves us to have a working knowledge of the various forms of surgical therapy available and the indications for their use.

Every year many hundreds of patients having pulmonary tuberculosis are given the advantages of surgical therapy, yet these represent only a small minority of those patients who might be treated with benefit. In the New England States, Hawes and Stone¹ found that only 4.2 per cent of the patients are given the benefit to be obtained by use of the various surgical methods, and this is probably representative of the country at large. On the other hand, in the larger clinics from 15 to 17 per cent of the patients are treated by surgical methods, and it is conservatively estimated that 30 per cent of all patients with pulmonary tuberculosis could be benefited by the application of some one of the surgical procedures. This failure to make full use of available therapeutic measures has frequently been due to indifference to the spread of ideas, to too technical discussions or lack of information. Therefore the purpose of this paper is to point out briefly in general terms those surgical procedures that have become valuable in the treatment of pulmonary tuberculosis.

A consideration of the procedures used in the treatment of tuberculosis in any of its forms

shows that the success of the treatment depends to a large degree on the amount of rest given to the diseased part, and this is especially true in pulmonary tuberculosis. Since the function of respiration never ceases during life it is obvious that one is face to face with a peculiarly difficult problem if direct rest of the diseased lung (*i. e.*, actual limitation of motion as against mere decreased activity) is to be attained, and it then becomes necessary to turn to one form or another of pulmonary compression.

INDICATIONS FOR SURGICAL INTERVENTION

It should be clearly understood that surgical procedures are not intended to replace nonsurgical methods of treatment in pulmonary tuberculosis, but are to be considered as adjuncts to these methods. We wish repeatedly to point out and stress the necessity for the closest coöperation throughout the course of the disease between the physician and surgeon, as by this means only can the proper time for surgical intervention and the correct procedure for the particular case be determined. The majority of procedures used in surgical therapy fall under the category of collapse therapy of one form or another. Certain other procedures (*i. e.*, vascular ligations) are still in the experimental stage and are not available for general use.

Collapse therapy is to be considered not only in those cases of pulmonary tuberculosis whose response to modern conservative treatment has shown that the prospect of ultimate arrest by these methods is doubtful, but also in those cases in which the rate of improvement may be increased by such therapy. The exact time at which collapse therapy should be instituted is to be arrived at only by careful study of the individual patient. Each one must be treated as a new problem and all the evidence available from the clinical course, physical and radiologic examinations, is to be considered. Now if it appears that symptomatic treatment alone is not accomplishing the desired result, we may consider the advisability of one form or another of collapse therapy. Speaking broadly there are no absolute, invariable contraindications to collapse therapy; conversely, its indications and the particular form of therapy to be applied are determined solely by the exigencies of the case at hand.

THE ACTION OF COLLAPSE

The frequent observation that the partial or complete collapse of a diseased lung has been followed by improvement of the patient's status has led to numerous hypotheses aimed at an explanation of this observation. It is not our purpose to enter into a discussion of theory, but simply to point out the more acceptable modern opinions.

Nature's method of healing tuberculous lesions is by fibrosis. The first of the factors which seem to aid in the healing process is the mechanical rest, the actual immobilization of the lung. This reduction of motion is undoubtedly inextricably related to the alterations in the flow of blood and lymph which is in turn directly related to the distribution of toxic products. Thus it is observed that

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following collapse of a diseased lung there is usually a short period of a few days in which there is a rise in temperature, followed in successfully treated cases by a prompt remission of fever. This has been assumed to be due to a process of so-called autogenous tuberculinization. This process likewise seems to offer some explanation of the frequent prompt healing of the disease in the contralateral lung. However, healing does not always occur; sometimes there is retrogression of the process and it is assumed that the tuberculinization was in excess of that desired. This is more likely to occur in cases of massive involvement of the collapsed lung or where the disease in the contralateral lung was not of a fibrotic nature. Briefly, by collapse the absorption of toxins is reduced and the general powers of resistance of the patient are improved.

Certain mechanical difficulties due to fibrosis are relieved by collapse therapy. Thus the dilatation of the good lung, brought about by the pull of the fibrosis on the involved side, exposes this healthy lung ultimately to secondary infections and bronchial dilatations. These mechanical difficulties are alleviated by collapse measures.

The next major result of collapse is the closing of cavities. It has been found that the approximation of the walls of a cavity is a most important factor in the healing process. The statement has frequently been made that complete collapse of the cavity is necessary to healing, but it has been pointed out that frequently healing occurs with only partial collapse.² By collapsing cavities not only healing through fibrosis is assisted, but the retention of toxic secretions in the cavity is prevented, and the toxemia due to the growth of secondary invaders is reduced.

A frequent result of collapse therapy and one for which collapse is frequently undertaken is the stopping of hemorrhages. This is probably brought about by the relaxation and contraction allowed to fibrous tissue which in turn compresses the bleeding vessels.

From the patient's point of view not the least of the results of the collapse is the relief from distressing symptoms. Cough is frequently reduced and is less severe, and sputum is reduced in amount and is raised more easily. These results often follow very promptly upon the collapse, but sometimes the alleviation of symptoms is gradual. The stopping of hemorrhages, which are usually a most disturbing incident to patients, has a remarkable effect on the patient's attitude.

TABULAR SUMMARY OF INDICATIONS

A tabular summary of the various indications for which one may institute collapse therapy clearly shows its wide range of applicability. These indications are arrived at from a consideration of the above described action of such therapy.

METHODS OF SURGICAL INTERVENTION

At this point it may be well to consider the paths surgery has attempted to follow in its search for a rational means of attacking the problem of

TABLE 1.—*Indications for Collapse Therapy.**

1. To place the disease process under conditions most favorable to healing.
2. To compensate for mechanical difficulties due to fibrosis.
3. To obliterate cavities.
4. To reduce the absorption of toxins.
5. To control hemorrhage.
6. To diminish the distress caused by certain symptoms.

* Modified from Davies.³

pulmonary tuberculosis and then to note the present trend of its progress. These various paths are outlined in the following table (No. 2).

The direct methods have been essentially discarded. The direct application of various medicaments with the hope of influencing the tuberculosis lesion by either the tracheal or intercostal routes has been frequently tried and found wanting. It is obvious that only a minute portion of the lesion can be reached by any drug application made by these means. Moreover, the injection of irritating medicaments into the lung parenchyma, bronchi or cavities has even been found to be harmful.

Cavity drainage, either by the transthoracic or bronchoscopic routes, has been attempted with very indifferent results for centuries. In spite of past failures, sporadic attempts at its use are still undertaken. Sauerbruch, in 1920, reported rather favorably upon its application in certain selected cases.

Although a very limited number of successful cases of pulmonary resection for tuberculosis have been reported, this method is not to be advised. In the first place, it is a very major procedure. Moreover its very advocates have stated that its application should be limited to the resection of small lesions strictly confined to the apex or other absolutely localized foci, and that even then it should be combined with a local thoracoplasty. Obviously these are the very lesions which would be expected to respond to either sanatorium treatment or the simplest forms of surgical intervention. It is questionable, to say the least, whether tuberculosis is ever sufficiently limited so that a conservative resection might be expected to eradicate all of the disease process.

We thus arrive at a consideration of the various forms of collapse therapy. The rationale of this form of therapy has been pointed out above. It is with this general type of treatment that the

TABLE 2.—*Surgical Treatment in Pulmonary Tuberculosis*

METHODS	
I. Direct Therapy	
(a) Direct medication	
(b) Cavity drainage (transthoracic and bronchoscopic)	
(c) Pulmonary resection	
II. Collapse Therapy	
(a) Artificial pneumothorax (general collapse, selective collapse)	
1. Intrapleural pneumolysis	
(b) Hemidiaphragmatic paralysis (temporary, permanent)	
(c) Extrapleural pneumolysis	
(d) Oleothorax	
(e) Thoracoplasty (partial, complete)	
III. Methods of Experimental Stage	

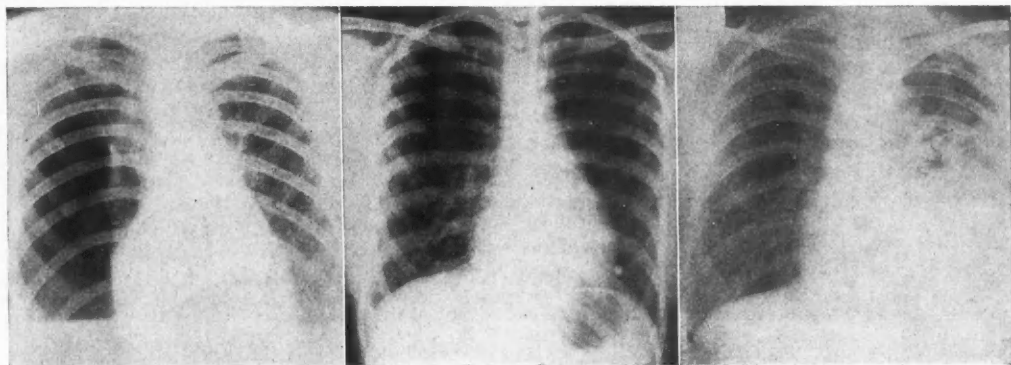


Fig. 1

Fig. 2

Fig. 3

Fig. 1.—Artificial pneumothorax: Pneumothorax on the right side, with a small amount of fluid at the right base. The right lung is practically completely collapsed. There are two pleural bands, extending from the visceral to the parietal pleura at the right top. The left lung is clear. The heart is slightly displaced to the left.

Fig. 2.—Selective collapse: Selective artificial pneumothorax collapse of the right upper lobe.

Fig. 3.—Phrenic avulsion: Two years after phrenicotomy, showing marked elevation of the left diaphragm and incident collapse of the lung.

majority of surgical procedures adaptable for combating pulmonary tuberculosis is concerned, and as a result of which sufficiently encouraging results are obtained to warrant the continued use of such procedures.

ARTIFICIAL PNEUMOTHORAX

The excuse for pointing out the value of an artificial pneumothorax in a paper on surgical procedures is not that we wish to suggest that the surgeon is required or even should be called upon to perform this simple procedure. On the contrary, we mention it solely because in a real sense it is the prototype of all forms of collapse therapy. Furthermore, we also wish to point out the advisability of supplementing certain surgical procedures with an artificial pneumothorax and mention other procedures which may increase the efficacy of some pneumothoraces in which adequate collapse has not been attained.

Artificial pneumothorax consists of the introduction of air into the pleural cavity, with the aim of collapsing the lung on the side in which the air is introduced. The customary procedure consists in gradually compressing the entire lung field by the repeated introduction of air into the pleural cavity at intervals of such frequency that each subsequent refill adds a greater volume than was left at the previous injection. This of course takes into consideration air absorbed in the interim. Recently it has been shown that it is often possible to collapse only the diseased portion of the lung. This is done by carefully regulating the intrapleural pressures, the desired result being obtained because the diseased lung is more compressible than the normal lung. This process has been termed "selective collapse."

When one of the surgical forms of collapse therapy has resulted in an inadequate or unsatisfactory collapse, or if it is felt that a more complete transient collapse will benefit the patient an artificial pneumothorax may be induced as a supplement to the primary procedure. This supplementary use of pneumothorax has been frequently

and successfully used in cases treated with hemidiaphragmatic paralysis and in thoracoplasty. Its more frequent use will undoubtedly increase the value of these procedures.

INTRAPLEURAL PNEUMOLYSIS

It has been found at various sanatoria that from 5 to 50 per cent of all cases of pulmonary tuberculosis require artificial pneumothorax therapy. Furthermore, of the cases in which pneumothorax is attempted, collapse has been reported inadequate in 20 to 70 per cent of all cases. However, in about 25 per cent of these cases in which the pneumothorax was unsatisfactory because of adhesions, this difficulty could be overcome by the procedure of intrapleural pneumolysis. The method in general use is that of Jacobaeus, introduced in 1913, although a few cases have been successfully treated by open pneumolysis⁴ or by the enucleation method of Maurer.⁵

The method of Jacobaeus consists essentially in the cutting of adhesions by a cautery introduced through a thoracoscope while the operative field is viewed through a second thoracoscope. Special instruments were devised for the operation by Jacobaeus and others. The method is best adapted to the freeing of thin string-like adhesions and is contraindicated in broad band-like adhesions, while the frequently met with apical adhesions are most difficult to remove because of their position. Certain dangers are inherent in the procedure, especially the production of hemorrhage, puncture of the lung and the production of an effusion.⁶ However, the operation has been performed successfully in such a large number of cases that in many clinics the procedure is considered a necessary adjunct to pneumothorax.

Because of the difficulties enumerated and because it is reported⁷ that cavities in 50 per cent of unsuccessful pneumothorax cases may be closed by hemidiaphragmatic paralysis this less dangerous procedure is preferred to intrapleural pneumolysis in cases of unsatisfactory pneumothorax; or the hemidiaphragmatic paralysis may be induced

as an adjunct to whatever collapse could be obtained from the pneumothorax.

Adhesions which might be sectioned by the method of Jacobaeus are shown in Figure 1.

HEMIDIAPHRAGMATIC PARALYSIS

The induction of a hemidiaphragmatic paralysis (phrenicus exairesis—phrenic avulsion) by an interruption of the motor-nerve impulses to the diaphragm through the phrenic nerve is the most frequently applied and simplest surgical method of obtaining collapse of the lung in the treatment of pulmonary tuberculosis. It may be employed as the initial procedure, may follow an unsatisfactory pneumothorax, and has been found to be of use following certain major procedures (*i. e.*, thoracoplasty) in which a completely satisfactory collapse has not been obtained. Likewise some are of the opinion that it is advisable to use a hemidiaphragmatic paralysis before any major thoracoplasty as a test of the patient's ability to withstand the more radical procedure.

Section of the phrenic nerve was first suggested as a treatment in unilateral tuberculosis by Stuertz in 1911, but in a large percentage of cases no paralysis or transient paralysis resulted from a carrying out of this operation. In 1922 Felix showed that this was caused by numerous anomalies of the phrenic nerve due to the connections of the accessory phrenic nerve. To overcome this, Felix proposed the usual modern procedure of phrenic avulsion or exairesis. This operation is performed under local anesthesia in a matter of minutes, and leaves an unobtrusive scar 2 to 3 centimeters in length. An effort is made to withdraw at least 10 centimeters of the nerve distal to the incision above the clavical, thereby assuring a complete and permanent paralysis.

There are methods other than phrenic avulsion for obtaining the hemidiaphragmatic paralysis. The nerve may be simply sectioned, which gives rise to a high percentage of failures, as was pointed out above. Transient paralysis may be obtained by injecting alcohol. Temporary paralysis, lasting for five or six months, may be obtained by crushing the nerve.

If the desired result has been obtained in the removal of the nerve, the paralyzed hemidiaphragm rises at once to an expiratory position unless prevented by adhesions. A gradual progressive rise then continues for six months to a year. Under the most favorable conditions the collapse obtained is in the neighborhood of one-sixth (400 cubic centimeters) to one-third (800 cubic centimeters) of the lung volume,⁸ while in pneumothorax or thoracoplasty complete collapse may be approached. The collapse of the diseased area depends to a great extent on the nature of the tuberculous process, the greatest degree of collapse having been found to occur in the proliferative rather than the exudative type of disease. However, the beneficial results of this procedure are due not merely to the collapse obtained, but likewise to the marked mechanical rest enforced upon the diseased lung.

Several thousand patients treated with hemidiaphragmatic paralysis have been reported in the

literature, and the results obtained with these cases have been very encouraging. Little danger is involved in performing the simple procedure, the mortality being less than 0.5 per cent for all operators, and more recent reports show this to be now more nearly 0.2 per cent. Complications, including mortalities, occur in about 1.2 per cent of the cases, hemorrhage and pneumonia are the most frequent and most likely to prove fatal, while others occasionally reported are Horner's syndrome, mediastinitis, pyothorax, pulmonary embolism, and pulmonary edema. No one has complained of any inconvenience from the permanence of the collapse, and several cases of successful bilateral diaphragmatic paralysis indicate the ease with which compensation takes place.

It is impossible to make any adequate statistical analysis of the therapeutic results of hemidiaphragmatic paralysis because of the wide variance in the severity of the disease in cases selected by different operators. Unilateral disease is the ideal, and most operators select this type of case as nearly as possible; but Matson⁸ treated thirty-four cases in which the disease was active or progressive in the contralateral lung and of these cases 52 per cent were much improved and only 5 per cent were unimproved or worse.

O'Brien⁷ has reported the results of 500 phrenic nerve operations. Of these, 288 showed disease in the contralateral lung and this process healed in 26 per cent, improved in 52 per cent, and was activated or continued to spread in 10 per cent of the cases. Of 378 cases with cavitation 50 per cent of the cavities were closed, 82 per cent were closed or reduced, and 19 per cent were stationary or larger. Cavities in the lower lobes were closed more readily than cavities in the upper lobes, yet 46 per cent of the upper lobe cavities were closed. He likewise found that, of forty-two cases with cavitation in which pneumothorax was not satisfactory, when these were treated with hemidiaphragmatic paralysis the cavities in 50 per cent of the cases were closed, while in only 6 per cent were the cavities unchanged or larger. These results, as reported by Matson and O'Brien, are typical of the experiences of all operators and seem to warrant the enthusiasm shown for this method of applying collapse therapy.

As the maximum collapse obtainable from hemidiaphragmatic paralysis is in the neighborhood of 800 cubic centimeters, a larger volume of collapse may frequently be desired. It has been found that this is often obtainable by the induction of a pneumothorax and that the hemidiaphragmatic paralysis plus the pneumothorax gives adequate therapeutic collapse in many cases when either procedure alone has proved unsatisfactory. Recently attention has again been called to this fact,⁹ and there is no reason why the combined procedure should not be used more frequently than it has been in the past.

SCALENIOTOMY

In the past few years the suggestion has been made that scaleniotomy, performed in conjunction with phrenic evulsion, would greatly enhance the

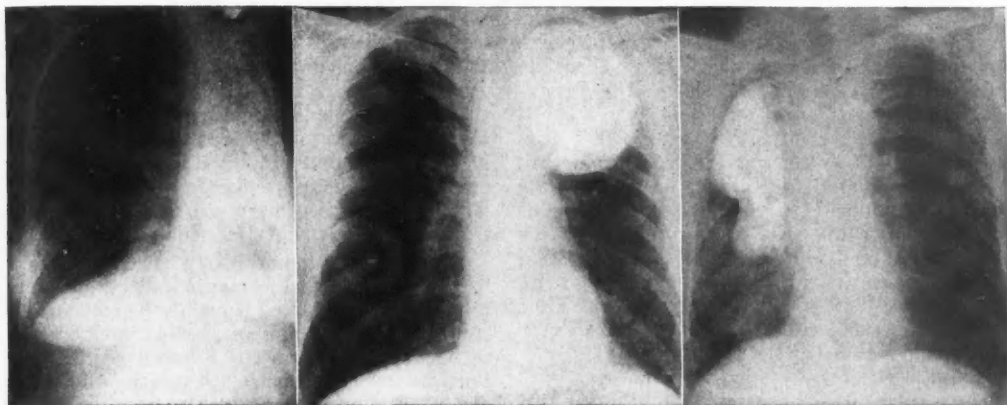


Fig. 4

Fig. 5

Fig. 6

Fig. 4.—Thoracoplasty: Three months after completion of second stage thoracoplasty, showing complete collapse of the left lung field and slight incidental scoliosis.

Fig. 5.—Paraffin filling: There is a rounded mass of paraffin filling obliterating the apex of the left pleural space, with incident compression of the lung in this area.

Fig. 6.—Paraffin filling: This illustrates some of the complications which may occur with paraffin filling. The plomb, which originally occupied the position similar to that in Fig. 5, is seen to be breaking up and a portion of it has worked its way downward.

efficacy of the latter procedure.^{10, 11} Scalenotomy consists in a section of the scalene muscles in the neck. These being accessory muscles of respiration a further limitation of movement of the thoracic cage, especially at the apex, was to be expected. The operation is performed simultaneously with that of phrenic evulsion and through essentially the same incision. Our own experience has led us to conclude that although scalenotomy is a relatively simple and feasible procedure, the clinical results attained thereby do not warrant its performance.¹²

OLEOTHORAX

The introduction of oil in large amounts into the pleural cavity for therapeutic purposes was first advocated by Bernou.¹³ This procedure has found few adherents in America, but is held in considerable favor on the Continent, especially among the French. In the treatment of pulmonary tuberculosis, its use in selected cases may be either (a) as a disinfecting agent, especially in tuberculous empyema, or (b) as a substitute for thoracoplasty in certain cases of spontaneous pneumothorax or complicated cases of artificial pneumothorax or (c) as a compressing agent where intrapleural pneumolysis is not feasible.

If reexpansion is desired a vegetable oil is used, whereas if constant compression is desired a non-absorbable mineral oil is employed. In either instance an aromatized oil may be added in graduated strengths should a disinfecting action be required. Either oil can be removed by aspiration should the necessity arise.^{14, 15}

It appears to us that oleothorax has a definite though small field and that it should be employed more frequently, especially in cases of tuberculous empyema and in those thick-walled cavities where pneumothorax does not give a satisfactory collapse but which a more major procedure is contra-indicated.

THORACOPLASTY

Resection of portions of the ribs to obtain collapse of a tuberculous lung was first undertaken in 1885 by de Cereuville, who removed only short sections of the ribs overlying the diseased area anteriorly. Brauer and Friedrich performed the first "thoracoplasty" in 1907 by removal of practically the entire lengths of ribs, one to ten. In the few cases treated by this operation the mortality was exceedingly high and it was soon apparent that, although correct in principle, modifications were necessary to make the procedure a success clinically. In 1911 Wilms and Sauerbruch independently performed, with only minor differences, what has now become the adopted procedure, the Wilms-Sauerbruch paravertebral thoracoplasty. When the unmodified term "thoracoplasty" is used it is usually this procedure which is under consideration.

There are forms of thoracoplasty other than the paravertebral type which, although limited in their scope, may be applied either alone or in conjunction with other surgical procedures when proper indications exist. Some of these procedures should be listed here. Parasternal thoracoplasty consists in the removal of sections of the ribs at the sternum and finds its chief usefulness in supplementing the collapse obtained by a paravertebral thoracoplasty. Also a few ribs may be resected locally for the collapse of small circumscribed areas. Then complete posterior removal of ribs one and two has been performed with very satisfactory results in locally collapsing the apex. Finally the periosteum may be removed from the ribs over a localized area, the periosteum and extrapleural tissue packed down tightly over the area to be compressed, and then after an interval when the new ribs have grown, permanently compressing the area, the packing and the original (now dead) ribs may be removed.

The Wilms-Sauerbruch paravertebral thoracoplasty consists of the removal of graduate sections of the vertebral ends of the ribs. These are usually graded somewhat as follows: 2 to 5 centimeters are taken from the first rib, 4 to 8 centimeters from the second, 8 to 10 centimeters from the third, 10 to 15 centimeters from the fourth to the tenth, and 8 to 10 centimeters from the eleventh. Archibald¹⁶ recommends the fitting of the resection to the case, taking greater sections over diseased and fibrosed areas. The operation is usually done in two stages, the second stage usually being done ten days to two weeks after the first stage, and either the upper or the lower ribs may be resected as the first stage.

Because of the major nature of the procedure the proper selection of cases for thoracoplasty is a most important problem. An ideal case would be one of unilateral chronic fibrous tuberculosis without complicating disease in which adequate sanatorium treatment had failed to arrest the disease; pneumothorax had been unsuccessful due to adhesions which could not be freed by intrapleural pneumolysis; phrenic avulsion had been performed without arresting the disease, and the resultant slight reaction had shown the patient's resistance to be adequate to withstand the thoracoplasty. This process of selection makes thoracoplasty the method of last resort which, because of the major nature of the procedure, is its correct position, and if in a properly selected case thoracoplasty has failed to arrest the disease, it is questionable if any further surgical procedures will have any markedly advantageous effect.

In some clinics the most rigorous standards are applied to the selection of cases, there being a feeling that it is as unfair to ask a surgeon to operate on patients that have progressed to a critical condition as it is to ask a surgeon to operate on a widely metastasized cancer of the breast. This may be correct, but there is a growing opinion that after every effort has been made to select cases at the proper moment there will still be presented numerous cases who either from neglect or apprehension have passed the point when any cure seems possible but for whom one's last slim chance remains in thoracoplasty, and these should not be denied. The statistical records resulting from the treatment of these cases will show a high percentage of failures, but the actual accomplishment with these "forsaken" cases will be rewarding.¹⁷

The degree to which one may deviate from the most rigid standards must therefore come from experience. This is particularly true with regard to the amount of involvement of the good lung, the amount of fever, and the complicating lesions. Certainly extensive cavitation in both lungs is a contraindication, but numerous cases are reported in which small cavities in the contralateral lung have healed following thoracoplasty. Certainly a high fever is a warning to go cautiously, but if there are no other contraindications, fever in itself cannot be considered too seriously, and patients running daily temperatures up to 102 and 103 degrees daily have been successfully treated. Com-

plicating diseases must be given due consideration, especially diseases of the heart. In thoracoplasty the heart is put under a greater strain than under any of the other surgical procedures because of the suddenness and completeness of the collapse, the moving over of the mediastinum, the danger of mediastinal flutter, and the severity of the operation itself. Therefore disease of the cardiovascular system offers a more serious contraindication here than in any other procedure.

Many cases of thoracoplasty have been reported in the literature and any review of results must, therefore, be selective. Roughly the combined results from a large number of cases show one-third practically cured, one-third improved, and one-third unimproved, worse, or dead;¹⁸ the risk of death being approximately the same as in operation for carcinoma of the intestine. As has been pointed out above, the results depend to a large extent on the selection of cases and for this reason mortality rates have varied in different series from 1 to 50 per cent.

Brown¹⁹ has reported two groups of cases for comparison. One group of thirty-six were given thoracoplasty following the failure of other methods; the other group of nine, in apparently the same condition, refused the advised thoracoplasty. After nine years, nine of the thirty-five are dead, six, or 17 per cent, of those receiving thoracoplasty have died of tuberculosis, while of the nine cases refusing thoracoplasty six, or 67 per cent, have died of tuberculosis, only one is clinically well, and two are still in a sanatorium. These groups are small, but make a most valuable comparison.

Bruns and Casper²⁰ have reported a series of ninety-six cases treated at the Fitzsimons General Hospital, where the tendency has been to broaden the scope of thoracoplasty and offer the patient a "last chance." Of these, 26 per cent were apparently cured, 16 per cent had the disease arrested, 5 per cent were improved, 4 per cent were unimproved, and 41 per cent died. The causes of death in this series are probably illustrative of those obtaining generally; they were shock, heart failure, spread of the disease, and wound infection.⁴

We have already pointed out that the statistical results depend to a large extent upon the nature of the cases selected and have only slight relation to the good that may result in doing thoracoplasties as a last resort. To illustrate this still further we may point out some of the results reported by Carter⁴ on fifty-three cases of thoracoplasty. By dividing his cases into good, moderate, and poor risks, he found that thirty of the thirty-three good risks recovered, while of the whole group thirty-five are apparently well.

In a large majority of cases thoracoplasty is surprisingly nondeforming because the shoulder girdle from which clothes hang is undisturbed. In a small number of cases an undesirable degree of scoliosis results from the collapse of the chest wall, but this may generally be avoided by proper postoperative care. Cameron and Mercer¹⁷ have devised a "plexaloid" cast which partially pre-

vents this scoliosis and at the same time increases the collapse. This is a light semirigid cast which is applied to the good side while straps tend to draw in the diseased side. Archibald, to obtain the same result, uses a corset made particularly for thoracoplasty cases, and likewise stresses the importance of the patient maintaining the correct posture after the operation.²¹

In discussing thoracoplasties we have dealt only with paravertebral thoracoplasty because it alone is of widespread applicability and interest, while the other types of thoracoplasty which have been referred to, although of no less value in the treatment of cases where the indications exist, are of such specialized usefulness that we have considered it wise to leave their consideration to papers of a more technical nature.

PARAFFIN FILLING

Paraffin filling (extrapleural pneumolysis—apicolysis) (Plombierung) falls into the category of procedures of limited usefulness. It is one of the methods of obtaining localized collapse and consists in the introduction extrapleurally of a mass of paraffin to obliterate the space between the thoracic wall and the collapsed lung. Other substances such as muscle and fat have been used, but none have been as satisfactory as paraffin because they tend to atrophy and become absorbed. The procedure is especially indicated in cases of apical disease where thoracoplasty is not desired. While most often used in unilateral apical disease, it may also be employed in bilateral apical disease. It has been found that small multiple cavities in the apical region may be closed most successfully, while large cavities and cavities in the lower lobes cannot be handled adequately. Frequently a patient will submit to paraffin filling while refusing thoracoplasty because the introduction of the paraffin is less severe and deforming than is the thoracoplasty.

Certain difficulties are met with in paraffin filling. Sepsis occasionally sets in, necessitating prompt removal of the wax with the institution of drainage. In the period in which the procedure was being introduced, cases were reported in which the material broke into the lung, worked out through the chest wall, or worked into the base. Occasionally the lung or pleura have been broken into, necessitating abandoning the operation. However, some cases have carried the paraffin well for eleven years, and as the technique and composition of the paraffin have been improved a large part of the difficulties seem to have been overcome. All the difficulties attached to the introduction of a foreign body in any portion of the human body apply as well in the introduction of paraffin into the thorax. Therefore we feel that this is not essentially a surgical procedure.

In a satisfactorily treated case a small exudate may form after the introduction of the wax. This usually soon resorbs and a fibrous connective tissue capsule 2 to 3 millimeters in thickness forms around the filling. It is exceedingly difficult to obtain complete collapse of cavities by this method

but, although desirable, this is not always necessary for healing. Numerous cases have been treated and have been reported in the literature, but it will not be advisable to discuss them here. A complete description of the method with a discussion of the indications, difficulties, and results may be found in the excellent article by Rogers.²²

RECAPITULATION

The last word in the surgical treatment of pulmonary tuberculosis is still anxiously awaited. Nevertheless we have endeavored to show that "collapse therapy" in one or another of its forms has earned a deserved niche in our armamentarium. We believe that surgery, kindly advised, under fullest coöperation between physician and surgeon, offers distinct hope to a vast number of tuberculous patients and therefore warrants your sympathetic employment.

490 Post Street.

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DISCUSSION

HAROLD BRUNN, M. D. (384 Post Street, San Francisco).—The general profession still has a rather hazy idea concerning the operative methods now in use for the treatment of pulmonary tuberculosis. Doctor Brown's paper has, therefore, given a very timely review of the surgical methods of use in tuberculosis. He wisely points out that this work requires the closest cooperation between the specialist and his surgical consultant.

There is still a large group of patients for whom collapsed therapy by means of artificial pneumothorax is impossible or only partially feasible, but where surgery is required. We believe that these persons should be given an opportunity to take advantage of one or another form of surgical collapse best fitted for the individual case. It is our belief that in the great majority of cases the paravertebral thoracoplasty of the Wilms-Sauerbruch type is fundamentally the best operation. In our experience the use of paraffin filling for apical cavities has not been at all successful. It may be adapted to a limited number of patients with small cavities at the apex centrally placed or in patients having apical cavities on both sides, where it would seem inadvisable to jeopardize or put out of commission a large portion of good lung such as happens in a complete thoracoplasty.

The main problem at the present time which, it seems to us, is still unsolved is the handling of large apical cavities with considerable fibrosis which, in the ordinary thoracoplasty operation, do not close and where there still persists a moderate amount of secretion with positive sputum. These patients may be better, perhaps, following surgery, but are not cured. One is then required to do secondary operations, removing ribs anteriorly or anterolateral. For such patients we are now removing the first and second ribs entirely from the costal cartilage to the transverse process posteriorly and such portions of the third, fourth and fifth, as may be required, and we believe our results are better than heretofore. It is too early to report on the final outcome in these patients. To this operation we have added in our later patients a pneumolysis, separating the pleura and the cavity from the vertebral gutter, as recommended by Bruns and Casper. They point out that the cavity in the vertebral gutter is the portion which fails to collapse in ordinary thoracoplasties.

We believe that Doctors Brown and Truman have given a very clear and concise picture of the different procedures which are of use in the treatment of tuberculosis at the present time.

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WILLIAM C. VOORSANGER, M. D. (490 Post Street, San Francisco).—Doctors Brown and Truman have presented a very complete review of the many procedures classified today under the head of collapse therapy. The first and most important of these and, incidentally the oldest, is artificial pneumothorax, which should always be attempted before major procedures such as phrenic-nerve resection and thoracoplasty. I have failed on several occasions to induce a pneumothorax, and after the fifth or sixth week of trial have succeeded. Phrenic exaeresis has not proved to be of as much therapeutic benefit as some, particularly O'Brien, have claimed. Whereas some patients have been helped by it, in others we have obtained hardly any result and occasionally a rapid spread of the infection. It should in most cases be performed as a preliminary operation to thoracoplasty. Artificial pneumothorax after exaeresis has in some patients proved very successful. I have a patient who had a basal cavity compressed by pneumothorax with good result; voluntary

expansion of the lung after two years with complete fibrosis; recurrence six months thereafter, recompression attempted but unsuccessful; phrenic exaeresis performed, spread of the infection upward, and then a very successful recompression with almost dramatic disappearance of cough and expectoration. The recompression, therefore, saved the patient from a thoracoplasty, which we had in mind if more conservative measures had failed and which seemed impossible before phrenectomy.

I am glad to hear the authors stress the value of cooperation between physician and surgeon in the selection of risks for thoracoplasty. Naturally, a physician who has carried a patient through two or three years of tuberculosis must be the one to make the selection for the surgeon, who in turn must pass upon the surgical fitness or risk. If this procedure is followed, more carefully selected cases of pulmonary tuberculosis will come to surgery and our figures of successful results will be improved. The ultimate result needs improving. We have too much recurrence of activity after a year or two years. We have, fairly often, too little actual cessation of the two main symptoms of tuberculosis, cough and expectoration, although in all patients we see a marked diminution. Thoracoplasty marks a great step forward in the treatment of pulmonary tuberculosis; its failure to completely obliterate activity may be placed squarely upon improper selection of risks. The physician has often been charged with waiting too long before recommending thoracoplasty. This charge can only be substantiated in a small percentage of patients. The other belief which is gaining ground, to rush all patients with unilateral extensive lesions to thoracoplasty, will prove of inestimable damage unless we spread the doctrine so well enunciated by the authors, that thoracoplasty must be reserved for that small group of patients who after a definite period of careful conservative treatment still show activity and symptoms, but whose physical condition is good.

Regarding other surgical procedures mentioned by the authors. I quite agree with them that "plom-bierung," or paraffin filling, is going to prove a rather negligible surgical procedure.

Oleothorax has also but limited value. It has been suggested in tuberculous empyema after aspirating the pus. Many of our empyemas are accompanied by bronchial fistulae, but in this class oleothorax is of absolutely no value and sometimes proves harmful. My own experience with oleothorax has not proved very satisfactory.

The authors have rightly shown us that there are several collapse procedures, each of which has its place and each to be used only after careful selection.

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WILLIAM LISTER ROGERS, M. D. (Medico-Dental Building, San Francisco).—The authors have condensed and presented a large subject in a very practical and sane manner. The close cooperation between physician and surgeon in the treatment of pulmonary tuberculosis has been well emphasized. That this condition actually is taking place is, I believe, well borne out by the fact that the incidence, in one form or another, of the minor surgical procedures has of recent date greatly increased. In other words, the surgeon is seeing many early cases which do not require a total thoracoplasty, but in whom some form of surgical therapy is deemed advisable. There are, however, unfortunately, many patients suitable for some form of collapse therapy who are taking the cure at home, under the guidance of the family doctor; or even in sanatoria, but in whom surgery is not being considered for one reason or another.

Greater stress has been rightly placed on our more accepted procedures. Unless one has a wealth of material or ample opportunity to develop his technique for such procedures as adhesion cutting, etc., he will probably do better by utilizing phrenectomy or some form of thoracoplasty for the necessary surgical procedure to be employed. Matson, in Portland, has developed

the adhesion-cutting to a nicety. We have had considerable difficulty with this procedure to date and, while the procedure appears simple, the complications may be very grave. On the other hand, we have used the paraffin fill on a group of cases, and are still using it in selected ones and so far have no reason to regret our choice.

From a surgical viewpoint I believe there are two exceptionally difficult groups of cases to obtain satisfactory collapse. First, the enormous apical thick-walled cavity, and secondly, the patient with an existing secondary bronchiectasis of the right middle or lower lobe. A bronchial stenosis may or may not be present. If present it is almost, if not entirely, impossible to rid the patient of all sputum by means of a thoracoplasty. In this suspected group bronchoscopy may prove of diagnostic value and also the guarded use of brominol. Bronchoscopy should not be used without due thought and consideration, as it is by no means an entirely innocent procedure when dealing with active pulmonary tuberculosis. However, it is of great value in the above group of cases, for if the bronchiectatic portion of lung can be proved to be free from tubercle bacilli, as is sometimes the case, lobectomy may be considered.

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ESTHER ROSENCRANTZ, M. D. (San Francisco Hospital San Francisco).—I agree with the statement that a larger percentage of tuberculous patients than those now receiving surgical treatment would probably benefit by one of the procedures described. To enable these patients to profit by these measures of relief there should be a closer coöperation than now exists between surgeons and physicians. Especially is this the case in those patients with chronic ulcerative tuberculosis, who stay year after year in tuberculosis hospitals, whose condition has improved to such an extent that there is no fever whatsoever, and who are apparently well except for the occasional cough and persistent positive sputum.

The tendency is to consider these patients incurable and suitable for routine medical treatment only. If, however, one considers how often the pathologic condition in the lung changes over a long period of time when the patient is improving, and how patients who on admission were bilateral, eventually fibrose on one side, while the other side remains active, and if one studies these patients from the standpoint of possible surgical intervention, I think that the number of patients who might be treated by one of the methods described in this paper would be found to be considerably higher.

There the responsibility rests with the physician since it is he who has constant access to the patient, and it is he who follows the course of the disease from the time the patient first comes for treatment.

THE LOCAL TREATMENT OF ECZEMA IN INFANCY AND CHILDHOOD*

By HIRAM E. MILLER, M. D.
San Francisco

DISCUSSION by Samuel Ayres, Jr., M. D., Los Angeles; Albert H. Rowe, M. D., Oakland; Clifford Sweet, M. D., Oakland.

THIS paper will consider briefly the local treatment of eczema in infancy and childhood from the dermatological standpoint. I do not believe that local treatment alone will cure most children with eczema. It must be combined with

dietary, allergic and other procedures. Neither do I believe that internal treatment alone will cure all of them. It must be used in conjunction with rational local therapy. The best results are obtained when pediatrician and dermatologist work together. Practically, however, a pediatrician with some dermatological training, or a dermatologist with a knowledge of pediatrics, can generally obtain satisfactory results.

Internal treatment is governed by a knowledge of the underlying cause in the individual case. Local treatment requires a knowledge of the reaction of different types of inflamed skins to various remedies. Some of this information can be obtained from textbooks, but most of it will come only with experience.

The choice of the remedy depends upon the type of the eruption, its severity, its location and extent, as well as climatic conditions. Each individual skin has certain idiosyncrasies as to drugs, as well as to types of medication. Some skins will not tolerate ointments, no matter what they contain; others may become irritated when lotions are applied.

Local medication should be mild at first, and should not be frequently changed in stubborn cases. A small number of remedies carefully handled will cure most patients. Certain remedies will give brilliant results with one physician, and yet always irritate in other equally skilled hands. It is best, therefore, to use only the remedies with which one is thoroughly familiar.

GENERAL CARE

In the treatment of any type of eczema, there are certain underlying principles that must be followed. All sources of local irritation should be removed before topical applications are considered. The child must be kept out of the sun, wind and overheated rooms. Ideally, during the winter months, the child's room should be heated and the windows kept open. The clothing should not be coarse nor irritating, and the child must not be dressed nor covered too warmly. Soap and water should not be used on eczematized areas. Olive oil or some similar bland oil may be used for cleansing purposes.

Diapers should be changed as soon as possible after being soiled. They must be carefully washed with a mild soap and thoroughly rinsed. Rubber pants should never be worn over the diapers by a child with an eczematous tendency.

Hospitalization is desirable, and necessary for many infants with extensive eczema. It often hastens recovery, and permits the carrying out of mechanical adjuncts to therapy. It also separates the child from distracted parents, and allows them to obtain some rest. It frequently changes an irritable and ungovernable child into a composed and happy one.

CLASSIFICATION

For descriptive purposes, as indicated in Table 1, there are four general types of eczema occurring in infancy and childhood:

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*Read before the Pediatrics Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

TABLE 1.—Types of Eczema of Infancy and Childhood

1. Overweight type	3. Intertrigenous type
2. Seborrheic type	4. Impetiginized type

Occasionally, the eruption in a child may be distinctly of one type. Generally, however, two or more types of the disease will be present at the same time, or during the course of the disease. This classification, however, will facilitate the discussion of therapy.

LOCAL THERAPY

The successful treatment of eczema is difficult without a knowledge of the use of crude coal tar. Table 2 explains its use:

TABLE 2.—On the Uses of Crude Coal Tar

Bi-product in the manufacture of coal gas			
1. Applied undiluted to localized areas of eczema at three-day intervals.			
2. Used in a paste or ointment, never under a bandage. To be removed daily with olive oil.			
1. R	Crude coal tar	2. R	Crude coal tar
	Zinc oxid aa .3- 2		Zinc oxid aa .3- 2
	M. and add		M. and add
	Corn starch 15		Petrolatum q.s.a.d 30
	Petrolatum q.s.a.d 30		M. sig. locally b.i.d.
	M. sig. locally b.i.d.		to dry areas
3. R	Crude coal tar		
	Zinc oxid aa .3 2		
	M. and add		
	Paste Lassar q.s.a.d 30		
	(no acid)		
	M. sig. locally b.i.d.		

Formula 3 has given the most satisfactory results in my hands.

The treatment of the various types of eczema is shown in Tables 3, 4, 5 and 6:

TABLE 3.—Treatment of Overweight Type of Infantile Eczema

Feeding of most importance in this type. Local applications must be soothing. Lassar's paste under mask; splints to arms. Calamine lotion or calamine cream. Ultra-violet light; occasionally x-ray therapy. Crude coal tar preparations. 5 to 10 per cent naftalan in Lassar's paste (without acid).

TABLE 4.—Treatment of Seborrheic Type of Infantile Eczema

Scalp: Remove crusts with olive oil.
 R Resorcin 3-1.2 1-3% sulphur,
 Glycerin q. s. ammoniate of mercury
 Petrolatum q. s. 30 or yellow oxid of
 M. sig. locally to scalp after mercury may be used
 removing crusts
Body: Care in cleansing skin; apply soothing lotions or pastes: 2% crude coal tar; 10% naftalan or 1-2% ammoniate or yellow oxid of mercury, all put in Lassar's paste (without acid).

TABLE 5.—Treatment of Intertrigenous Type of Infantile Eczema

1. Exclude lues and monilla infections.
 2. Cleanse with oil; wash diapers thoroughly; do not use rubber pants; keep areas dry.
 3. Dusting powders, lotions or pastes superior to grease.
 Stearate of zinc. Equal parts of boric acid and talc. May add 25 per cent calamine, 25 per cent zinc oxid and 1/2 to 1 per cent camphor.
 Lotio nigra and aq. calcis, equal parts. Calamine lotion. Lassar's paste, etc., are of value.

TABLE 6.—Treatment of Impetiginized Type of Infantile Eczema

1. Removal of crusts with boric acid compresses.
 2. Application of 1 per cent ammoniate or yellow oxid of mercury in Lassar's paste (no acid).
 3. Coryza, otitis, scabies, pediculosis capitis may be the underlying cause.

COMMENT

The successful treatment of eczema in infancy and childhood demands considerable attention to details. It requires more than the mere application of a grease. The long duration of the disease, as well as the probability of recurrences, should be explained to the parents early in the course of treatment. Fortunate indeed is the practitioner who is called to treat these children late in the course of their disease.

384 Post Street.

DISCUSSION

SAMUEL AYRES, JR., M. D. (2007 Wilshire Boulevard, Los Angeles).—I am in complete agreement with Doctor Miller's views regarding the importance of crude coal-tar in the treatment of these cases. To secure the best results, the physician should confer with his favorite pharmacist regarding the details of compounding this remedy and, having satisfied himself that the druggist is able to prepare a satisfactory ointment, he should instruct his patients to have the prescriptions filled at that place. As Doctor Miller has indicated, the coal-tar and zinc oxid should be mixed separately; then the cornstarch and the petrolatum separately, and then these two mixtures combined. This should result in a smooth, coal-black paste. If the color is gray, green, or brown, you can be certain that it was not made properly and that it is very likely to irritate.

I do not agree with Doctor Miller in insisting that the tar ointment should not be covered with a bandage. On the contrary, I insist that it should be bandaged. This accomplishes several things: it insures that the areas are kept covered with the ointment, it prevents scratching, it prevents soiling of the linen, etc., and it insures against exposure to sunlight, which would be most irritating since coal-tar exerts a photosensitizing effect on the skin. I have never observed any deleterious effects from covering the parts to which the ointment has been applied.

However, if coal-tar is used for more than two or three weeks continuously, a pyogenic folliculitis occasionally develops, which usually clears promptly on changing to a weak ammoniated mercury ointment. Coal-tar ointment is contraindicated in the presence of follicular infections, but it is extremely efficacious not only in the ordinary allergic eczemas, but also in eczematoid eruptions due to yeasts or fungi, or to bacteria, as in cases of infectious eczematoid dermatitis.

Dermatology and pediatrics are greatly indebted to Dr. Charles J. White of Boston, who introduced crude coal-tar therapy in eczema.

One other type of eczema which has not been mentioned is a more or less generalized oozing or exfoliative, due to arsenic. I have seen two such cases in small babies, in whom arsenic in abnormal amounts was found in the urine and which cleared up under the oral administration of sodium thiosulphate, with a bland external application such as cocoa butter or plain Lassar's paste. The source of arsenic in both cases was probably in the form of medication which the mother was taking during pregnancy.

With Doctor Miller, I would emphasize again that local treatment alone is quite inadequate in the successful management of most cases of infantile eczema.

ALBERT H. ROWE, M. D. (242 Moss Avenue, Oakland).—Eczema in infancy and childhood is usually due to food allergy, though inhalant and contact sensitizations are of importance, especially in older children. To aid in the determination of the allergic etiology, skin tests with all foods eaten, and with important inhalant and contact allergens to which the child may be exposed, are indicated. The skin-sensitizing bodies to the causative allergens may not be present, though children are more apt to react than are adolescents or adults. Because of this fallibility of the skin reaction, trial diets and test environmental control may be necessary to help in the discovery of the fundamental allergies. The necessity of such trial diets has been emphasized by Blackfan and Schloss, and more recently by Hill and Cohen. Hill's article on "Eczema in Infancy" in the *Journal of Pediatrics* not only describes local therapy detailed by Doctor Miller, but discusses diets based on positive and negative skin reactions. For the milk-sensitive child, Sobee, as described by Hill, and more recently Cemac, recommended by Cohen, are of definite value. The child who gives positive reactions to animal emanations, miscellaneous substances, dusts, and possibly pollens, with or without reactions to foods, necessitates attention to diet, environment and contacts if control of eczema is attained. Local therapy, as described by Doctor Miller, must be used with practically all patients, whether or not allergic control is carried out. With the elimination of the allergenic factors, the eczematous lesions require much time to disappear and are hastened by dermatologic procedures, so tersely described in this paper by Doctor Miller.

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CLIFFORD SWEET, M. D. (242 Moss Avenue, Oakland). I agree whole-heartedly with Doctor Miller's point of view. The child who has eczema must be studied thoroughly and treated carefully with all the means at our command.

Since hearing his paper last April, I have used crude coal-tar more than I had formerly, and have found it very useful. All diapers should be boiled daily, as well as thoroughly washed and rinsed. For the impetiginized lesions it is often necessary to use a stronger ammoniated mercury than the one per cent ointment. After making certain that the patient's skin is not hypersensitive to ammoniated mercury, a stronger ointment may be prescribed. In severe cases it is often necessary to remove the crusts oneself or have it done by another experienced person; few mothers will do it thoroughly.

In addition to all other attention to detail, much effort must be expended in carefully explaining to the parents, not once but many times, the problem to be solved. I emphasize what Doctor Miller has said, and add in brief the explanation which I have found comforting to perplexed and worried parents:

1. Eczema is not a disease.
2. Eczema is not contagious.
3. Eczema is not evidence of tainted blood, and no family has aught to be ashamed of because some member has it.
4. Eczema is evidence that the individual reacts too readily to foreign proteins. This reaction to proteins is universal in all human beings, varying only in the degree of its severity.
5. Proteins are present in all living structures, and therefore the offending protein may not be contained in the food substances which are our chief source of protein food.
6. The child with eczema is in every way a normal, healthy human being to whom we will give our best efforts in order to assist him over his present time of very real and distressing difficulty. Fortunately, in the vast majority of babies with eczema the acute hypersensitiveness diminishes after the first several months, and the body learns to live more successfully with its varied protein intake and contacts; just as by experience and education the child learns to become a successful member of a varied and often irritating human society.

FRACTURES AT THE LOWER END OF THE RADIUS—THE ROLLING-PIN METHOD FOR THEIR REDUCTION*

By WILLIAM ARTHUR CLARK, M. D.
Pasadena

DISCUSSION by John Dunlop, M. D., Pasadena; William F. Holcomb, M. D., Oakland; Frank A. Lowe, M. D., San Francisco.

FOLLOWING fractures near the wrist, accurate apposition of the fragments is necessary for function as well as appearance. Slight offset or angulation in the radius or ulna at this site will result in noticeable deformity which would not be apparent in regions where the bones are more thickly covered with soft tissues. Also, function may not be restored 100 per cent unless anatomic reduction is accomplished. The ugliest and most crippling deformity is caused by radial deviation and anterior displacement of the distal fragment. The classical Colles's fracture may also result in slipping or settling of the distal fragment toward the radial side, and perhaps also posteriorly, carrying the wrist and hand with it. This may occur even two or three weeks after reduction, especially if the ulna styloid has been broken, thereby loosening the anchorage of the carpus to the ulna, or if the patient is elderly and union slow with some absorption in the fragments. It may occur also as a result of imperfect reduction. If the distal fragment is left with a very slight offset or slight tilt, there is a tendency for the slight deformity to become a bad deformity, due to the constant pull of the overlying tendons.

REDUCTION METHODS

Primary reduction to anatomic position, followed by careful splinting, should preclude these difficulties. Indirect methods of applying force to the short distal fragments are frequently ineffective, resulting perhaps in partial reduction, but leaving more or less offset in apposition. Extension on the hand with countertraction on the forearm gives a force which is expended mostly on the tendons, very little being applied to the bone fragments. Flexion, pronation, and adduction of the wrist, though sometimes necessary, are usually not sufficient for complete restoration of normal position. Most surgeons have abandoned these indirect, indefinite manipulations for the direct application of force to the bone fragments. Scudder, Roberts and Kelley, and the textbooks of others describe methods of reducing Colles's fracture by pressure with the operator's thumbs on the distal fragment, accompanied by manipulation and traction.

ROLLING-PIN METHOD

When pressure with the thumbs fails, something harder with which to push against the distal fragment is necessary. After experimenting with various sizes and shapes in wood, I found that the most serviceable thing to use in reducing these

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Fig. 1.—Showing the rolling-pin and method of its application.

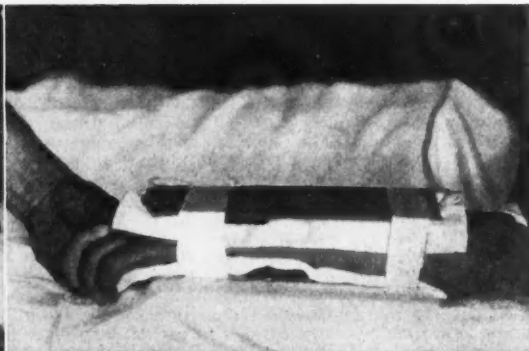


Fig. 2.—Splints showing pads (black) which hold fragments by pressure.

fractures is a roller about one inch in diameter and five inches long, the ends being smaller than the middle so that it can be conveniently handled. With this simple instrument the force can be accurately placed, easily controlled and carefully changed in position and direction. Much greater and more definite force can be obtained with it than with the thumbs or fingers because it is hard and resistant when pushed against the fragment. The soft tissues of the wrist, together with the soft tissues of the thumbs, make too thick a pad between the thumb bones and the wrist bones for transmission of the force. With the elimination of part of this soft padding, the hardwood of the rolling-pin comes in close contact with the bone, pushing aside some of the soft tissues over the wrist.

The patient should be lying down with the broken arm on a firm table. Adequate anesthesia is essential, either local or primary general. The arm is laid palm down over a triangular-shaped wooden block which serves as a fulcrum under the anterior aspect of the radius about two centimeters proximal to the fracture. The assistant holds the elbow down firmly against the table; and if there is excessive posterior displacement of the distal fragment, he also holds the hand in hyperextension at the wrist. The operator, facing proximally with relation to the arm, places the roller across the dorsal aspect of the radius at right angle to the shaft just above the distal fragment. With one hand on either side of the patient's wrist, the operator's thumbs are hooked over the handle of the roller. Firm pressure is made so that the roller is felt to be right down on the bone. This pressure is maintained as the instrument is rolled distally against the distal fragment. It first impinges on the posterior corner of this fragment, the force thus being in a distal direction with relation to the fragment. As the roller continues on toward the wrist, the force changes gradually from distal to anterior, thus pushing the fragment into normal position. This rolling process usually has to be repeated several times. If palpable deformity persists, more force in the anterior direction should reduce it. Of course, it is possible to go too far and get a slight anterior position of the distal fragment. One can

prevent this—make the method foolproof, as it were—by removing the triangular support from under the radial shaft and laying the arm on the firm flat table-top, palm down, with only a thin pad under the shaft when doing the final anterior push. This thin pad fills up the normal curve of the radius just above the wrist, keeping the shaft from being pushed anteriorly, while the distal fragment is stopped by the table.

The fractures of both radius and ulna from 3 to 5 centimeters above the wrist, with complete posterior displacement and overriding of the distal fragment, can be easily reduced by the roller method. The term "easily" is used in a comparative sense, with relation to other methods of extension and manipulation. I have not failed to reduce one of these fractures in the past three years by this method, while formerly open reductions a few days later, after struggles and failures at closed reductions, were frequent. These fractures are no longer a source of dread, provided they come for treatment within the first twenty-four hours.

MODIFICATION OF THE ROLLER METHOD

It has recently been found that a roller of smaller diameter is best for the initial application of force against the overriding distal fragment. The arm is placed over the wooden prism support, as for Colles's fracture. The assistant holds the elbow down with one hand, and with the other he grasps the patient's hand and bends the wrist in hyperextension so that the distal fragment stands up almost perpendicular at right angle to the shaft. The operator presses the small roller (one of the handle ends of the large roller may be used) against the dorsal aspect of the shaft, just above the fracture, and rolls it down against the distal fragment. The first impact comes against the dorsal cortex near the proximal end of this fragment. The force at this stage must be in a distal direction, its line practically parallel with the shaft. The smaller roller enables one to apply the force as nearly as possible to the end of this fragment. This end is pushed distally until the overriding is corrected. At this point the assistant brings the patient's hand down, thus allowing the distal fragment to be pushed over the

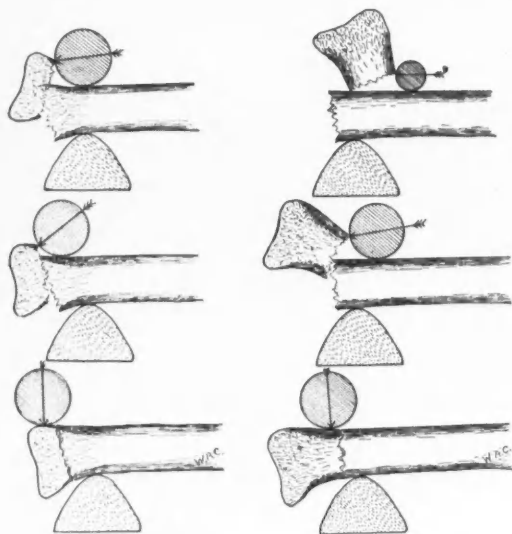


Fig. 3.—Longitudinal section of radius. Arrows show change in direction of force as the roller is rolled over the distal fragment. Left, Colles' fractures; right, fracture 4 cm. above wrist, small roller at first.

dorsal cortex of the proximal. The larger roller is now used to give the final force in an anterior direction, which pushes the fragment in line with the shaft. The entire maneuver may have to be repeated to make the distal fragment slip around the corner of the posterior cortex of the shaft—the keynote of success for perfect reduction. The final rolling smooths out any jog in the fragments.

This is the type of wrist fracture usually encountered in children, although occasionally seen in young adults. The typical Colles' fracture is almost never seen in children. Only one such was found in sixty-five cases of fracture near the wrist in patients from three to twenty years of age, and that one was a boy of eighteen. They get either a fracture 3 to 5 centimeters above the wrist, or a separation of the epiphysis. The epiphyseal separations, with or without fracture of the cortex, are also amenable to the roller, the technique being the same as that for Colles' fracture.

IMMOBILIZATION METHODS

For immobilization after reduction, anteroposterior wood splints are best. They can be accurately applied with felt pads to produce pressure at the proper places over the fragments. They also permit easy inspection of the skin for possible pressure sores. The chief objection to plaster casts is that the location and degree of pressure on which we depend for maintaining position cannot be accurately controlled, either while the plaster bandage is being applied, or subsequently. With splints the pads can be seen after the adhesive straps are applied and can be easily shifted if necessary before putting on the gauze bandage. I wish to condemn the use of stock splints, shaped to the hand and wrist, especially the so-called Walker splint. If such splints are put on with no pressure pads and no dorsal splint, deformity is likely to recur. It seems that too much depend-

ence is put on the splint alone, thereby creating a feeling of false security. The wrist is comparatively flat—at least the skeletal part of it is—and a flat splint is more adapted to its immobilization than one with a trough-shaped surface.

The same mechanical principles should be observed in splinting as in reduction; that is, the splints should act as levers with three points of force: a pad serving as a fulcrum, anterior to the shaft just above the fracture; another pad posterior to the distal fragment; and the third point of counterpressure at the distal end of the posterior splint over the muscles where no pad is needed. Should the styloid of the ulna be broken off, the splints should be shaped to produce an ulna deflection of the hand and carpus to avoid the tendency to radial deflection.

I have used this method in twenty-seven cases to date, and the results have been so satisfactory that I would recommend it to others for a trial at least.

65 North Madison Avenue.

DISCUSSION

JOHN DUNLOP, M. D. (63 North Madison Avenue, Pasadena).—I have listened with interest to the foregoing paper of Doctor Clark, and wish to state that I have seen many x-rays of his cases and have been struck with the remarkably accurate reductions which he has obtained by this method. I have not seen the patients clinically, so cannot vouch for other than the x-ray examinations.

In considering both bone fractures of the forearm, I should think that the method was not so accurate or safe as reduction over the fluoroscope, unless this method could be used over the fluoroscope, in which case I feel that there might be a field for it. However, reductions over the fluoroscope of both bones are usually not difficult, unless there is intervening tissue.

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WILLIAM F. HOLCOMB, M. D. (230 Grand Avenue, Oakland).—Doctor Clark has given us a very ingenious, although somewhat complicated method of reducing fractures of the lower end of the radius. The x-ray pictures which he has demonstrated show beyond doubt that he is proficient in this method, and bespeaks of his skill therein.

It is my opinion, however, that more skill is necessary, and more mechanical ability used in order to reduce a fracture by this method than by the simple method of manipulation which has proved, in most hands, satisfactory. I was permitted to read this paper in March, and at that time there came under my care an explosion fracture of the lower end of the radius. The fragments of the radius were both displaced dorsally and ventrally.

It occurred to me that the pressure of the fulcrum below, and roller above, would make a very satisfactory reduction. A manual attempt was first made, which was not satisfactory. The second attempt was made with the roller and fulcrum and, probably due to my mechanical inability, the result was very little, if any, improved.

I feel, therefore, that while this method may be useful in his hands, it is a complicated method and is entirely unnecessary in a large majority of the cases. Where difficult fractures of this type are encountered, as in the breaking up of an impaction or in late cases with newly formed callus, a Thomas wrench is eminently satisfactory.

As far as immobilization in plaster is concerned, it has always proved more satisfactory, in my hands, than wooden splints. I find that pads under wooden splints slip out, that the patients are able to remove and alter them, particularly in the case of children. Plaster of paris can be molded nicely to fit the arm, and does not constrict if it is properly applied.

FRANK A. LOWE, M. D. (870 Market Street, San Francisco).—Doctor Clark presents a method of reduction which has given to him good and satisfactory results in twenty-seven cases, so the rolling-pin method must have its merits. I agree that the grasping of the fingers, and trying to exert any impression on the displaced fragments, can meet with nothing but utter failure; the latter I have seen numbers of times in watching the novice work. I feel that we cannot standardize our fractures into direct posterior or anterior displacements, and therefore I cannot see where the rolling-pin method can be applied to any advantage in oblique, comminuted or transverse fractures of the medially or laterally displaced types.

Reductions that Doctor Clark can accomplish with his mechanical device, I can reduce, plus a greater percentage of the other common displacements, by the thumb-and-finger method, applying my own modifications of the latter and adding certain tricks of the trade that are essential to maintenance of the reduction once accomplished.

In Doctor Clark's hands the rolling-pin works well; in my hands direct thumb-and-finger fulcrum, with adequate hyperflexion, hyperextension, adduction and abduction, together with correct amount of force to engage the ends of the bones, works well. The latter method has yielded most excellent and satisfactory anatomical repositions and perfect results. It is a serious situation and a retrograding of good teaching that, as soon as a young surgeon sees a fracture, he should allow his brain to become a revolving mass of cog-wheels, with no particular clear thought in view, when a little simple thought and judgment would tell him how and what he is to do without the use of barbarous instruments, such as wires, staples, nails, plates, ice-tongs, etc.

Fracture work, as it stands today, is in a state of chaos and needs a few good leaders in medical schools to teach the art and mechanics of manipulative and nonoperative control of fractures.

I do not like the clamp-like pressure that two padded splints afford, with additional pressure pads and circular strips of adhesive to maintain and prevent displacements of the fractured ends. Splints are invariably getting out of adjustment each week, and have to be changed or replaced and taped and re-bandaged. I believe this to be a bad feature, along with the impossibility of preventing supination and pronation of the forearm; the latter two movements are the cause of many fractures slipping after having once been ever so beautifully reduced.

Clamp-like pressure, constriction by adhesive tape bands to hold the splints, dangers of ischemic palsy, displacements of fragments, supination, pronation, nerve and tendon injury, can all be avoided to the minutest degree by a properly padded plaster of paris cast, immobilizing the wrist and elbow joints. The cast can be fenestrated for pressure pads, if the latter are needed.

The reduction is accomplished, an assistant maintains the same and holds the extremity in proper position while the padding, which is taken from a one-pound roll of best grade Johnson & Johnson (long fiber) absorbent cotton, is placed on the hand, wrist, forearm, elbow, and arm by the surgeon and nurse. The cotton padding is reinforced where necessary and bandaged into place by a sleazy gauze bandage, so that a snug-fitting dressing is made; and over this the plaster of paris bandage is wrapped and a cast is formed and perfectly fitted to the normal contour of the extremity, and after the setting this is trimmed and split on the posterior surface to prevent circular constriction. In Colles's fractures and epiphyseal displacements, the hand is deviated to the ulnar side so as to give a moderate pistol-gripping at the wrist joint, and the latter partially flexed. These two deviations, with various artifices, prevent radial and posterior displacements in a way that no other methods can equal. The forearm is placed at a right angle, with the arm in full supination. The cast remains in place not less than six weeks in young subjects, while either the cast or further splinting is many times necessary from two

to six weeks longer in elderly persons, where there is apt to be a delayed union. The latter can be diagnosed by palpation, inspection, careful watching, or perhaps checked by re-x-raying.

All fractures should be radiographed before and after setting, in both anteroposterior and lateral views.

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DOCTOR CLARK (Closing).—The rolling-pin is not necessary in all cases; some are easily reduced with the fingers. The method is offered as a refinement in technique for changing an incomplete reduction into a good reduction. The advantage over the Thomas wrench is, that with the roller the point of pressure can be changed so much more easily and delicately than with the wrench. Lateral displacements can be corrected by changing the direction of pressure accordingly.

I have never noticed a displacement after reduction due to pronation or supination, and do not think immobilization of the elbow necessary for fractures less than four centimeters above the wrist. If a cast is applied displacement is likely to occur during its application, and subsequent correction is much more difficult than with the splint method. The trough-shaped cast does not give as firm and secure fixation as flat splints against the flat wrist.

THE NASAL SINUSES—THE PRESENT STATUS OF THEIR TREATMENT*

By ANDREW B. WESSELS, M. D.
San Diego

DISCUSSION by Robert C. Martin, M. D., San Francisco; Chester H. Bowers, M. D., Los Angeles; Rea Ashley, M. D., San Francisco.

THERE has been distinct progress in the medical and surgical procedure, as well as in the diagnosis of sinus disease itself, during the last few years. The acute infections with severe pain and temperature are usually readily recognizable. Transillumination and radiography make the diagnosis more or less certain. If drainage can be readily established with cocaine and adrenalin shrinkage, these infections will usually take care of themselves with the use of heat and nasal irrigations. In the cases where there is obstruction to drainage, puncture or lavage through the normal opening, as in the case of the maxillary sinuses and resection of a portion of the middle turbinates as in the case of the frontal and ethmoid sinuses, will frequently be sufficient to give relief. Occasionally, of course, the frontal sinus has to be opened externally before drainage can be established. Acute sphenoidal blocking may necessitate removal of the whole, or part, of the middle turbinate to facilitate the approach to the face of the sphenoid, unless drainage can be established by shrinkage of the membrane. Iodin vapor insufflation has recently been advocated for acute maxillary sinusitis.

In chronic sinus disease the diagnosis is much more complex and treatment much more difficult. The public has heard so much about sinus disease that patients frequently consult the physician with diagnosis already made. Because of unsatisfactory sinus surgery, resorts like Tucson, Phoenix and

* Read before the Eye, Ear, Nose and Throat Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

Palm Springs are Meccas for the sinus disease sufferer. What warm, dry air does for the sinus sufferer is too well known to need comment.

OPERATIVE TREATMENT

The operative treatment of sinus disease and the results of surgical intervention have been very unsatisfactory because of the incompleteness of the surgical procedures and unfamiliarity with underlying pathology. Allergic sensitization is often the beginning of nasal obstruction and the consequent blocking of the sinuses. Frequently these symptoms will simulate sinus infection. Intumescence of the nasal mucous membrane is communicated to the sinuses, and the flow of mucous increased and the blocking of the normal openings will interfere with the ingress of air. Repeat this condition frequently from infancy into adult life and a hyperplastic or purulent sinusitis is grafted on the allergic sensitivity. That many individuals sensitive to food and pollen have been operated on for sinus disease is too well known, and no relief was found until the causative factor in diet or surroundings was removed. If there be any doubt at all, all modern methods dealing with allergic symptoms must be exploited.

RADIOGRAPHY OF THE SINUSES

Radiography of the sinuses has greatly advanced in recent years. Hyperplastic membrane in the sinuses, particularly in the maxillary antra, can easily be demonstrated and fluid levels can also be determined. The use of iodized oil by injection into the sinuses, or displacement of air and radiography should also have a place in the diagnostic technique.

Frequently the lining membrane of the sinuses will have gone through the different stages into atrophy and finally will show, on examination, normal transmission of light and a negative radiograph. The cell count of Sewall is very valuable in these cases. In the study of lateral stereoscopic films the question of clarity of the ethmoid cells, whether sclerotic or atrophied, is attempted. In the sphenoid sinuses whether the walls show thickened membrane, sclerosis or atrophy of bone of the walls. In the oblique, projection through the orbit one ethmoidal group is uncovered from the other to show clouding of individual cells or bone changes.

Renewed emphasis is justly being placed on films of the base of the skull, taken in the vertical position, centering below the chin. Properly taken films in this position will show unusually clear detail of the posterior ethmoid cells and the sphenoid sinuses without any overlying structures.

DEVELOPMENT OF SURGICAL PROCEDURES

The surgery of the sinuses has undergone many modifications in the last decade. The use of local anesthetics has made the approach much more satisfactory. Temporizing with a chronic sinus condition has proved futile and radical or complete sinus operations must be considered the only means we have at hand for an attempted cure of sinus infection. All these measures have been

adopted only after careful study of former unsuccessful operative work. To lay down definite rules of operative indications is absolutely impossible. Each case must be dealt with as an entity. Repeated failures of cure of chronic sinus disease are frequently interpreted as indicating improper diagnosis.

Patients have developed an aversion to the word "radical" as applied to sinus operations. I agree with Ferris Smith that the expression should not be used. A "complete" sinus operation sounds much more satisfactory and not so alarming, and the patient usually agrees that the operation should be "complete."

The preturbinate route to the maxillary sinus is preferred by many surgeons, and is successful only if free drainage is established and all diseased membrane removed. This can only be accomplished when the whole of the maxillary sinus cavity is visible. The Caldwell-Luc technique is, perhaps, used more extensively than the preturbinate route because of easy access and clear vision of the interior of the sinus. The dangers of loss of sensation of the teeth in the region of the incision and injury to the infraorbital nerve must be considered. The vertical, instead of the horizontal incision has been advocated to obviate this injury to the dental nerves. Here again, free ventilation and drainage must be established, and all the lining membrane must be removed. There must be nothing in the nasal passage to obstruct drainage or ventilation, and portions of the middle and inferior turbinate bodies must be removed if indicated. It will be unnecessary for me to enlarge on the regeneration of mucous membrane in the operated sinus. The results of intranasal surgery on the ethmoid labyrinth have long been unsatisfactory and fraught with danger. It is impossible to visualize the remote cells comprising this complex sinus, and unless aided by direct vision, these cells cannot be drained or destroyed. The different operations evolved for the exenteration intranasally of the ethmoid labyrinth all fall short of the complete removal of all these membranes. The external operation is becoming more popular in the hands of operators. Sewall's technique, for tying the ethmoidal arteries, renders the operation practically bloodless, and, with good illumination and a knowledge of the anatomy, all the diseased cells can be destroyed and the lining membrane removed. The approach to the sphenoid sinus is also facilitated by this technique, and with experience, the sphenopalatine artery can be ligated before the face of the sphenoid is broken down and the lining removed.

The intranasal approach to the frontal sinus is distinctly hazardous. Any blind approach is non-surgical. The technique of Halle is certainly dangerous, and the different rasp operations are only temporary measures. The external route, as outlined by Lynch and later by Sewall, is comparatively easy and nonmutilating. The technique has been improved upon in minor details, and has proved successful in many hundreds of cases.

The treatment of chronic sinus disease is successful only when "complete" operative measures

are used, which means free drainage, thorough ventilation and a method of approach which enables the surgeon to visualize the entire limits of the sinus cavity so that all diseased membrane can be removed.

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DISCUSSION

ROBERT C. MARTIN, M. D. (384 Post Street, San Francisco).—Doctor Wessels has taken a common-sense viewpoint in his paper, which is a difficult one to present because of the amount of ground covered.

This word of caution as to recognizing and being surgically conservative in regard to allergic noses is timely. It is failure to recognize these that has resulted in the bad repute into which nasal surgery has fallen.

It is true that any nasal surgery, to be successful, must be thorough, and in some cases responding poorly to intranasal procedures, the external operation on the ethoids is indicated. There is often disappointment as to results on the frontal, if the Sewall technique is followed. We believe that antrotomies alone in dentally infected antra are efficient, if the cases are not of too long standing.

Doctor Wessels has brought out the fact that we are not primarily treating a nose but a patient, a truth sometimes lost sight of.

✱

CHESTER H. BOWERS, M. D. (1136 West Sixth Street, Los Angeles).—Doctor Wessels has brought the sinus problem up to date for us. In regard to the acute cases, I should like to particularly emphasize the point that the cloudiness to transillumination is due, not to pus, but to membranous edema. Many coryzas have acute antral symptoms with dark antra, but clear up readily with shrinkage alone and without purulent discharge. We should not be too hasty in shrinking acute antras, but should first treat nasal disease locally and employ measures directed toward the general condition for several days. Operative failure in chronic cases has been largely due to too hasty surgery and insufficient study, with resultant incorrect diagnoses. In most cases general care, along with conservative therapy, should be given a fair trial before resorting to surgery. In ethmoidal and sphenoidal diseases the Proetz treatment should be instituted before any operative procedures are advised. When surgery is indicated, I believe, with Goodyear, that our tendency should be toward conservative surgery of restoring breathing space, allowing ventilation and establishing drainage. If this is done, fewer "complete" operations will be found necessary. Finally, may I stress the great importance of two things: first, histopathologic and bacteriologic study of our cases and, second, the close relationship existing between sinus disorders, diet allergy, and the endocrines.

✱

REA ASHLEY, M. D. (384 Post Street, San Francisco). Doctor Wessels mentions several points which, to me, are very important and merit emphasis: They are:

1. After reasonable local medical measures have failed and surgery is necessary, the surgical procedure should be complete enough to correct the underlying pathologic condition.

2. The rhinologist must be constantly on the watch for allergically sensitive noses, and operate them only after other methods fail.

3. The radiologists have improved their technique in making radiograms to the point where good x-rays are invaluable in making the diagnosis of sinus disease.

4. Dry climate certainly benefits many patients where surgery fails.

5. Finally, the treatment of chronic sinus disease is successful only when complete operative measures are used, and by this is meant free drainage and thorough ventilation.

THE LURE OF MEDICAL HISTORY*

FIFTY YEARS OF PROGRESS IN THE PREVENTION OF DISEASE†

By J. C. GEIGER, M. D.

San Francisco

III‡

TYPHOID FEVER

TO immunize against the several diseases means their almost certain elimination. The lowering of the mortality of diphtheria presents one of the interesting chapters on the value of research in the discovery and the use of antitoxin. Another outstanding achievement is the control of typhoid fever, now so infrequently seen that it may be considered uncommon and even rare; but a few years ago it was one of the commonest "fevers." Early in this century major cities of the United States and other countries expected and experienced periodic outbreaks of the disease, but today medical educators have no little difficulty in obtaining cases of typhoid fever for class demonstration purposes.

Certain communicable diseases show more or less regular cycles of incidence. This has been well demonstrated in measles, influenza, poliomyelitis, and other diseases. It is believed by many that this may be true in tuberculosis, but that the cycle is of a longer period. In typhoid fever, while there may be minor cycles, there has been a steady and progressive decline in the incidence. Outbreaks occur, however, in spite of the fact that the epidemiology of the disease is clearly understood and in spite of the brilliant record made. This would indicate either that there are other avenues of transmission as yet unknown, or that the application of measures demonstrated to be effective is not rigorously carried out. The latter explanation is obviously correct: we do not place in full operation the available control measures.

The experience in the armed forces of the United States and of the other great nations clearly demonstrates what can be done in controlling typhoid fever. The incidence in the army during the World War was so low that the Surgeon-General's report stated that "typhoid and paratyphoid fevers are of minor importance." In a group of 1,900,000 men, there were fewer than 900 cases of typhoid fever, an incidence of less than one-half per thousand. This is an enviable record, especially when one considers the incidence during earlier years. The Russo-Japanese War, with the rigid application of modern sanita-

* A Twenty-Five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of CALIFORNIA AND WESTERN MEDICINE. The column is one of the regular features of the Miscellaneous Department of CALIFORNIA AND WESTERN MEDICINE, and its page number will be found on the front cover index.

† One of a series of public lectures by invited speakers, conducted by the Stanford University School of Medicine. From the Department of Public Health, San Francisco.

‡ Part I of this paper was printed in CALIFORNIA AND WESTERN MEDICINE, November number, page 327; Part II, December number, page 406.

tion and immunization methods by the Japanese and the relative lack of such measures in the opposing Russian forces, showed conclusively the value of control measures. The morbidity and mortality rates were markedly higher in the latter group.

In contrast with these demonstrations in military groups, there are but few instances on record of such a program applied to a civil population. The eradication of the disease will be possible only when there is placed in operation a plan which shall include some of the features of the military program. Sanitary engineering has protected the water supplies of cities willing to pay for such service. Efficient health officials safeguard the milk supply through dairy inspection, pasteurization, and milk-handler examination. Attempts are made to follow the carriers of *B. typhosus*, but this presents many difficulties. Immunization against the disease is offered and encouraged, but this advantage is not accepted as readily as it should be.

Typhoid fever is a preventable disease. Its continued presence is a challenge to the conscientious health official. The public must be informed of the necessity of protection by vaccination, if they will persist in drinking from open streams of "clear, cold mountain waters," which very frequently are polluted by deposits of human excreta, and if they continue to frequent beaches upon which is turned untreated or raw sewage. The program, in addition, should include the search for bacillus carriers, particularly in food handlers, and the follow-up of all known carriers at regular intervals. It is essential, of course, that the active case of typhoid fever be isolated, and that the bodily discharges be effectively disinfected. The justification for quarantine in typhoid fever, however, is questioned. There is no valid reason why a case of typhoid fever may not be cared for in the open general ward if certain simple measures are carefully executed.

Typhoid fever will continue to exist, probably, unless the contributions of modern sanitary science are thoroughly utilized. The time has passed when we can carelessly dispose of sewage and other devastating wastes by turning them into the nearest lake, stream, or bay. Man wants a protected water supply, yet he frequently disregards all consideration for his neighbor and even pollutes his own supply. Modern methods of sewage disposal and water purification are not prohibitive in their cost, and conditions demand that such installations be made everywhere in the not too distant future.

DIPHTHERIA

Diphtheria is a specific infectious disease caused by a rod-shaped organism called the Klebs-Loeffler bacillus. The site of the disease is usually in the nose, throat, or larynx, the constitutional symptoms being caused by a toxin liberated by the growing germ. The disease is spread by direct contact with people who have the disease, or with carriers—people who harbor the organism in the nose and throat, and yet are immune to the disease.

Owing to the liberation of the soluble toxin, the disease may be controlled in the patient by the early administration of antitoxin. The usual rules for isolation of the patient are in force just as in scarlet fever.

Children need not have diphtheria. It can be prevented by a simple harmless treatment with toxin-antitoxin or toxoid. In contrast with scarlet fever, no disease lends itself to a prevention program like diphtheria. Since the introduction of vaccination against smallpox, no form of active immunization against a communicable disease in the civil population has received such widespread acceptance by the public, and such general endorsement of the medical profession, as toxin-antitoxin immunization against diphtheria.

In a study of over one hundred of the larger American cities, Armstrong and Walker found that nearly all are doing some toxin-antitoxin immunization among school and preschool children, mostly, however, among children of school age. Only five cities had secured immunization of 25 per cent of the school children. So generally accepted has toxin-antitoxin become that the appraisal form of the American Public Health Association gives full credit for diphtheria control only to cities which have secured immunization of at least 25 per cent of their preschool population.

In San Francisco toxin-antitoxin immunization was begun in 1925. Since that time, 22,714 children of preschool and school ages have completed immunization. Practically all of the work has been done in the public and parochial schools in the kindergarten and first grade. Immunization is offered to San Francisco children of preschool age in the nine infant welfare stations of the Department of Health.

One of the striking features in San Francisco mortality and morbidity statistics of the past few years is the remarkable decline in morbidity and mortality in diphtheria. From 1,725 reported cases with 116 deaths in 1924, the number has decreased to 144 reported cases with five deaths in 1931. A similar decline in diphtheria has occurred in a number of large American cities during this period, and in New York City the Health Department has attributed it to toxin-antitoxin immunization of school children. The reported San Francisco cases and deaths from diphtheria, together with the number of individuals immunized, have been tabulated as follows:

Year	Cases of Diphtheria	Deaths	Immunization
1921.....	1710	141	.....
1922.....	1517	119	.....
1923.....	1708	148	.....
1924.....	1725	116	.....
1925.....	623	37	1605
1926.....	612	31	1110
1927.....	572	21	5277
1928.....	415	20	1049
1929.....	360	17	3600
1930.....	264	14	3606
1931.....	144	5	6457

The fact that as rapid a decline in diphtheria mortality in the various age groups occurred in San Francisco, as in many cities that attributed a similar decline to toxin-antitoxin immunization,

should make us critical of unanalyzed figures on the causative relation of that procedure to the falling diphtheria mortality.

Although San Francisco figures are not available to indicate the value of toxin-antitoxin, there is ample evidence of its efficacy where immunization has been extended to a considerable proportion of the population. In Auburn, New York, a city of 36,000, where 85 per cent of the school children have been immunized, Sears reports that in the past three years cases have been reduced from about eighty-five to five per year, and deaths from fifteen to one, and that one a questionable diphtheria case.

An intensive study of some 8,000 children immunized in Providence shows that approximately 90 per cent of the children who received three injections of toxin-antitoxin were subsequently protected against diphtheria. As few of these children were retested (Schick), it is probable that such cases as did occur were in children who failed to acquire immunity in one course of injections. Among 15,000 children immunized or naturally Schick-negative, the prevalence of diphtheria has been only one-tenth of the rate in the same group of the rest of the population.

If toxin-antitoxin is to play any important part in the control of diphtheria, it is self-evident that a considerable proportion of the children in the more susceptible age groups must be immunized. The ideal procedure would include immunization of the preschool group, say, from one to four years. Immunization at this time would carry the child over the period of highest fatality and greatest susceptibility to diphtheria. On account of the administrative difficulty in reaching children of this age, it is questionable whether large cities will be able to secure immunization of a sufficient proportion of this population to control diphtheria. Immunization of pupils in the kindergarten and first grade leaves unprotected the children at the ages in which the highest case fatality from diphtheria occurs; but, from the administrative standpoint, it is probably the most practical scheme.

If any considerable proportion of the school children are immunized, there is also a definite reduction in the exposure in the home of younger children who are themselves less liable to come in contact with cases. No one has yet shown just what proportion of the population needs to be immunized to prevent any serious spread of a disease of low infectivity such as diphtheria, but it can be seen off-hand how rapidly the increase of immunes decreases the opportunity for effective contact between susceptibles.

Although there is no evidence that toxin-antitoxin has been an important factor in the marked decline of diphtheria in San Francisco and elsewhere for the past six years, there is every reason to believe that if immunization is extended to a considerable proportion of the children in the most susceptible age groups, it can be more definitely the deciding factor in the ultimate control of diphtheria.

(To be continued)

CLINICAL NOTES AND CASE REPORTS

SOLID TERATOMA OF OVARY

By R. W. BINKLEY, M. D.
Selma

IN going over the literature on teratomata of the ovary, one is at once impressed by the lack of uniformity in classification of these growths, and also the admission, by practically all writers, of the inadequacy of the present classification.

By most of the writers, for example, they are divided into cystic teratomata and solid teratomata, both forms being called teratomata owing to the fact that the histogenesis of the two is apparently the same. Then, in speaking of this growth, one must qualify the type to which reference is made, since, from a clinical standpoint, they are vastly different.

Because most of us are familiar with the term "dermoid cyst, and with the growth itself, it seems that a clearer classification is that of Lynch, who on account of their common origin, classifies them as embryomata (a term which in itself gives a clue to the origin) and then subdivides embryomata into (a) dermoid cysts and (b) teratomata. With this classification, one must not confuse the ovarian dermoid, or cystic teratoma, with the true dermoid of ectodermal cell inclusions along the lines of embryonic fusion. Both types of embryomata are potentially tridermal, though at times all three layers may not be demonstrable, and the essential difference histologically is in the age of their embryonic cells.

The dermoid has progressed in a more orderly way toward the formation of definite organs, though very imperfect; while the teratoma has advanced too rapidly to develop a definite pattern, and is composed of a jumbled mass of embryonic cells with little attempt at organ formation. Askarny proposes the name "teratoma embryonale" for the solid ones, and "teratoma adultum" for the dermoid cysts.

The histogenesis of these two types of growth is still conjecture, and neither of the two advanced theories, nor a combination of the two, will as yet serve without criticism.

The blastomere theory of Marchand and Bonnet is favored by some writers as adhering more closely to nature's fundamental principles; but by this theory it is difficult to explain authentic cases of ten dermoids in one ovary, and eleven in another. The multiple origin of ovarian dermoids is best explained by the germ cell theory of Wilms; but this theory, too, fails in explaining such growths as occasionally occur remote from the ovary.

It is evident that if they have their beginning early enough, the cells from which they arise are totipotent and capable of giving rise to ectoderm, entoderm, and mesoderm.

Admitting a common origin of all embryomata, from a clinician's viewpoint, they are widely dif-

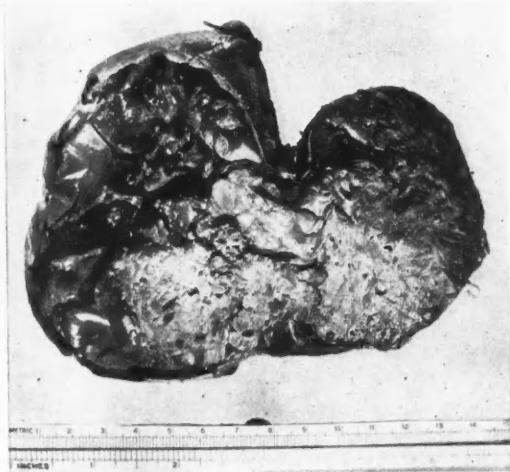


Fig 1.—Photograph of the original tumor sectioned.

ferent. The dermoid is one of the commonest ovarian neoplasms encountered, constituting, in various estimates of literature, from 5 to 15 per cent of all ovarian tumors; and the casual operator is familiar with their gross pathology and clinical history, their course being essentially benign.

The case I wish to present is one of teratoma, often spoken of as solid teratoma, and one which invariably gives a different clinical picture. It is a very rare condition by comparison, literature giving us less than one hundred cases in all. There was no record of a case in the Bellevue Hospital up to 1925, though their gynecologic cases averaged eighteen hundred per year.

It is attended by a grave prognosis, the mortality being generally estimated at from 80 to 97 per cent. Frank collected a series of thirty-seven cases, with a mortality of 97.2 per cent. Pfannenstiel found a mortality of 86.8 per cent in a series of thirty-two cases. Geist gives a mortality of 85 per cent. Harris reports a patient well after ten years who was operated upon at the age of five years and ten months, and who at that age had developed premature puberty and precocious somatic development. The growth from this patient showed definite malignant changes. The operation consisted of removing the involved ovary and tube; the normal ovary and tube of the other side, together with the uterus, being left intact.

The surgical procedure in these cases depends upon the surgical judgment of the operator, and the limited experience of others; but a complete removal of the involved side intact is imperative, as puncturing or rupturing of the growth will lead to implantations. In the case of dermoids of the ovary, the procedure may be more conservative, especially during the child-bearing age.

REPORT OF CASE

The patient, a girl thirteen years of age, was first seen on October 8, 1929, complaining of a "sideache" which had occurred at intervals for the past two months. The pain was generally in the right side, but occasionally felt in the left groin. It was always

worse after exercise, and had led her to be excused from physical education work at school. Never severe enough, however, to cause her to miss school until on date of examination, at which time it was worse and was accompanied by diarrhea. She has had several attacks of diarrhea in the past two months, alternating with constipation.

Family History.—American, above average, intellectually and socially. Father, L and W, at 37. Mother, L and W, at 37. Two brothers, L and W, 9 and 6 years. Two sisters, L and W, 15 and 4 years.

Personal History.—Full term, normal delivery, birth weight eight pounds. Breast fed three months, and then on Eagle brand milk. Developed satisfactorily except nervous and restless. Always rather thin, but this was a family characteristic. No sickness in past, except measles. Frequent so-called "leg aches" since age of five. Above average in school. Has not started menstruating.

Physical Examination.—Well developed, fairly nourished, blond girl, who entered office walking and not giving evidence of any marked discomfort. Height, 58 inches. Weight, 86 pounds. Head, neck, eyes, ears, nose and throat essentially negative. Breasts normal for age. Heart and lungs negative except for some tachycardia, due probably to nervousness. Temperature and blood pressure, normal. Extremities and reflexes normal.

Abdomen: Patient recumbent gave appearance of a four months' pregnancy. A tumor mass was felt in the midline extending up to the umbilicus. Felt solid and smooth throughout. No fluid demonstrable in abdomen. Rectal showed pelvis filled with solid tumor mass, separate from uterus.

Diagnosis.—Tumor of right ovary. Surgery advised.

Subsequent History.—On the evening of October 11, three days after initial examination, she developed more severe pain in right side and was quite tender in R. L. Q. Urine: 1019, albumin 0, sugar 0. Microscopic negative. Blood count: Hemoglobin 70, red blood cells 4,200,000, white blood cells 18,000. Differential, not done.



Fig. 2.—Photograph of one-half of one of the secondary tumors.



Fig. 3.—Section of original tumor.

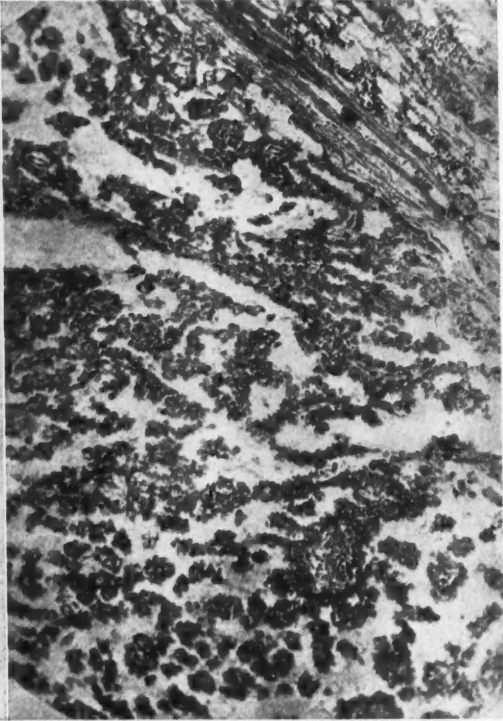


Fig. 4.—Photomicrograph of secondary tumor, showing an adenocarcinomatous arrangement. The picture was quite uniform throughout.

Operation.—On October 12, midline, suprapubic incision, under gas and ether anesthesia. Upon entering abdomen, free, straw-colored fluid was encountered and a tumor mass was seen to fill abdomen to above the umbilicus, and was covered by adherent omentum. Upon freeing the omentum, the lower abdomen contained bloody fluid, though no bleeding points were encountered. The omental adhesions were fibrinous, and easily freed by the gloved finger.

Further examination showed a twisted pedicle to the tumor, with one complete turn of the pedicle and the distal end of the right tube. There were two distinct parts to the tumor, separated by a slight constriction: the upper or abdominal part was cystic and the wall was transparent in places; the lower or pelvic part had to be separated, it being adherent in the cul-de-sac. The mass was removed, together with the right tube en masse.

Gross Pathology.—Tumor mass, 14 centimeters in length and 8 centimeters in diameter, separated into two rather distinct parts by a constriction, as shown in figure. The proximal part is solid in consistency, and has tube attached and the remains of pedicle. This part is edematous on surface and suggests the beginning of gangrene. The distal part is cystic, being smooth and translucent, except at points where fibrinous adhesions had left their mark and points where the wall was transparent. It contained a rather thin fluid with many floating particles that could be seen through the transparent portions. Tumor was fixed without opening.

Microscopic Pathology.—Sections taken through solid portion. The sections show a very curious picture. There is no recognizable ovarian tissue present. The stroma is made up of an embryonic type of apparently actively growing connective tissue, giving it a pale appearance. Throughout the stroma are glandular spaces, which vary markedly in size and shape. Many of the glands contain a homogeneous pink staining material; some of the glands, particularly the larger

ones, are lined by an epithelium which resembles squamous epithelium. The upper layers are very much flattened, and are present as fibrillar material, pink-staining and without nuclei. Other spaces are lined by a columnar epithelium of a mucoid variety; still others by cells resembling those of the upper respiratory tract. There are small aggregations of the squamous cells described, here and there, and a number of rudimentary hair follicles, as well as sebaceous and sudoriferous glands. In addition, one sees several oval bodies showing the structure of cartilage. Other bits of tissue resemble muscle, though practically no nuclear elements are seen, and there are also several areas which resemble cross-sections of nerve fibers.

A number of groups of small darkly staining cells show no definite structural arrangement; these betray a number of mitoses, and resemble somewhat the embryomata of the kidney, according to Doctor Connor. He feels that the tumor has definite malignant tendencies, and suggests very close observation of the patient, although if the tumor were free and completely removed it might carry a favorable prognosis.

Diagnosis: Teratoma of ovary. Dr. D. E. Morton.

Subsequent History.—Patient made an uneventful recovery, wound healing per primum and sutures removed on October 22, 1929.

Patient was requested to report at monthly intervals, but failed to do so and was lost track of until June 23, 1930, practically eight months later, when she was brought in because of her inability to control her urine. She complained of no pain, but stated that when she sneezed or coughed, or moved suddenly, she lost some urine. Examination at that time showed a huge abdominal tumor, giving appearance of a seven months' pregnancy. The tumor was lobulated and felt solid, and there seemed to be a separate mass in the left lower quadrant. Rectal showed pelvis filled with mass that was continuous with abdominal portion.

On June 24 she was unable to void urine, and required catheterization. The family was opposed to further surgery, so it was decided to try x-ray treatment; although in literature I could find record of only one case having been treated with x-rays. That case was reported by Dr. Edw. A. Bjorkenheim in *Acta Obstetrica et Gynecologica Scandinavica*, and then the x-ray treatments proved of no value. The patient was turned over to a competent roentgenologist on July 1, and at that time treatments were started.

On July 16 she was again operated upon, through a midline incision, under gas and ether anesthesia.

Upon entering the abdomen, three distinct and separate tumors were found. The one previously felt in the left lower quadrant was an omental implant, the size of two fists—glistening, grayish white in color, smooth and almost solid, but with some cystic points that bulged slightly. The next was retroperitoneal, laying slightly more to the right of midline, at the level of umbilicus, and adherent firmly to several loops of intestine. This one had several areas, rather darkly pigmented, and more cystic in character. The third one was wedged tightly in the pelvis, and extended up into the abdomen, more on the left.

Complete removal was impossible, so the omental transplant was removed for specimen, and the abdomen closed without drainage, extra stay sutures being used in anticipation of abdominal distention. The girl, however, made an uneventful recovery, and healed nicely.

Treatments by x-ray were again advised as a last resort, and the patient was once more referred to the roentgenologist.

The patient was not seen again until July 25, 1932, when the size of abdomen having decreased perceptibly, and her health having improved, she was able to return to school. She began to menstruate in November, 1931, and menstruated regularly for three months, and then skipped until May, 1932. When seen on July 25, 1932, she was complaining of pain in the right side, and examination showed the abdomen greatly distended by a huge lobulated tumor mass. The skin was tight and showed numerous striae, she was markedly anemic, and sick-looking.

By August 15, 1932, the pain was so severe and cramps in the right leg so intense, as to require morphin for relief. Her condition grew rapidly worse, until she expired at 6 p. m. on August 21, 1932.

Postmortem.—The parents would consent only to opening of the abdomen. Extremely emaciated young woman, with abdomen distended far beyond size of a full-term pregnancy. Frame appeared as a skeleton, with but slight covering. Abdomen was opened from xiphoid to symphysis, and the abdomen was filled by the two tumor masses described at the second operation. The intestines were all displaced to the flanks, and the omentum was contracted high, and was a contracted lace work of small, pearl-gray tumors, varying in size from pin point to a marble, most of them being about the size of a grain of wheat and up to that of a pea. The parietal peritoneum was studded by myriads of growths of the same character, so close together that there was not room to place a finger tip without touching one of these growths. The liver was filled with growths, the largest of which was the size of a walnut. The intestines were covered with similar implantations, but smaller, and the mesentery was filled with somewhat larger ones. Upon removing a part of the diaphragm, which was also involved, it was found that some of the growths had penetrated into the chest cavity to involve the pleura, and that the mediastinum was filled with the growths.

COMMENT

The two main growths were removed for study, and are shown in the accompanying figures, as were also portions of other organs which were removed for sections.

Their size is indicated by the yardstick, and they were both solid, grayish white in color, nodu-

lar in part, and covered with adhesions of surrounding viscera. A gross photograph of one of these tumors sectioned is shown. The microscopic sections show a rather uniform type of growth, that is, an adenocarcinoma; but this is not unusual, and is explained on the basis of carcinomatous change in certain of the epithelial elements of the teratoma, with subsequent metastases (which may also occur in the dermoid cyst). McCallum states, "While it is true that the teratoma itself is benign, it is not at all uncommon to find the development of a distinct carcinoma at some point in its epithelium, exactly as we find it in the body in general."

SUMMARY

1. A comprehensive classification of teratomata should be adopted.
2. The cystic and solid types have a common origin, and vary only in age of cells.
3. The prognosis in case of solid teratoma is grave; in case of cystic teratoma, or dermoid, the course is usually benign.
4. The cystic type is very common, while the solid type is extremely rare.
5. The histogenesis of ovarian teratomata is not yet satisfactorily explained by either the blastomere theory of Marchand and Bonnett, or the germ cell theory of Wilms.
6. The treatment in case of solid teratomata should be radical and with care.

Medical Building.

A SIMPLE DEVICE FOR USE IN THYROID SURGERY

By GEORGE A. JOHNSTONE, M. D.
Los Angeles

THE usual method of placing a patient upon the operating table for a thyroidectomy has a number of disadvantages both to the patient and the surgeon, as well as to the surgeon's assistants. For example, it is always desirable that the surgeon, when doing a thyroidectomy, should have as much exposure of the thyroid as possible by placing the patient in a position which will throw the thyroid closer to the surface of the neck. The usual method employed for obtaining this position is that of placing a sand-bag posteriorly to the cervical and upper thoracic regions of the patient; but while the purpose of this is to elevate the cervical and upper thoracic regions, it has proven very inefficient in several respects. The hardness and inflexibility of the sand-bag cause much distress to the patient. There is no way of adjusting the position of the patient for the convenience of the surgeon in opening and closing the wound without causing additional discomfort to the patient; and, furthermore, it is not possible to raise and lower that portion of the body involving surgery so as to give the correct elevation necessary to the most efficient work of the surgeon.

A sheet suspended by a frame for the purpose of separating the anesthetist's field from the field

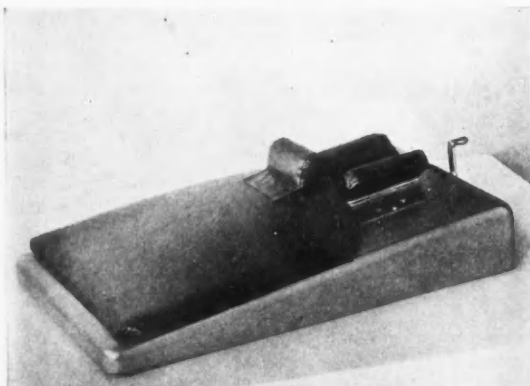


Fig. 1.—Showing operating table devised for use in thyroid surgery.

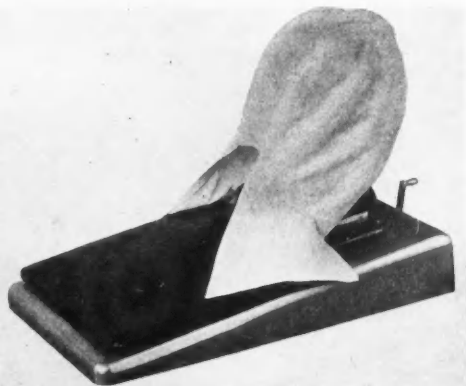


Fig. 2.—Showing use of the hood.

of surgery serves as a great handicap to the surgeon, since it is in the way of his elbow when he wishes to work from certain positions. It also limits the room of the assistants for their work.

ADVANTAGES OF THE TABLE

A device which will eliminate or minimize the discomfort to the patient, and give the surgeon and his assistants every possible advantage in doing a thyroidectomy, has been developed by the author, who suggests the following as chief advantages of his device:

Conformity to Shape of Patient.—First, it is constructed so that it will conform to the shape of each individual patient, regardless of size or form. The adjustable part is made of material which gives comfort, and yet is firm enough to keep the patient in a stable position.

Correct Elevation of Thyroid.—Second, the back rest can be mechanically raised or lowered by the simple turn of a crank (located at the head of the device) without any discomfort or inconvenience to the patient, thus making it possible to get a correct elevation of the upper thoracic and cervical region for each step of the operation. For example, when it is desired to throw the thyroid close to the surface of the neck, this can be done by raising the back rest. This rest is arranged so that the center is elevated, leaving the sides sloped for the dropping of the patient's shoulders, and the elevation of the part to be operated upon. Then, when relaxation of the tissues and muscles is required for suturing, the back rest can easily be lowered to the point where the most suitable position is desired.

Special Hood.—Third, a specially designed hood and frame make it possible for the surgeon and his assistants to work freely; for since the hood is shaped to fit over the head of the patient, the surgeon and his assistants are not hampered by the obstruction of a partition which would be in the way of their elbows while operating, and yet is sufficiently large to give ample room for the administration of an anesthetic. Because of the roominess of the hood, the patient has a feeling of perfect freedom in breathing; and this is a great advantage where only local anesthesia is

employed. The hood is especially designed to fit snugly under the chin and down the sides of the neck, with a skirt on each side sufficiently large to tuck under the patient's shoulders, thus giving a neat arrangement for keeping the field of operation absolutely sterile. It can be placed in the sterilizer without injury to the fabric, and will retain its original shape after sterilization.

Adjustability of the Head Rest.—Fourth, an adjustable head rest gives a comfortable position for a patient of any size, and assists in obtaining the desired position of the thyroid.

Adaptability to Any Operating Table.—Fifth, this device can be used on any type of operating table, simply by placing it in the correct position.

The base and hood frames are made of metal, attractively nickel-plated; and the back and head rests are neatly upholstered with a good quality of fabrikoid.

4019 Pico Street.

TREATMENT OF DIABETES INSIPIDUS

By HAMILTON H. ANDERSON, M. D.

AND

ALFRED C. REED, M. D.
San Francisco

VARIOUS theories have been suggested concerning the relation between the posterior pituitary lobe and water elimination. Published experimental findings indicate that the decrease in water elimination produced by injections of posterior pituitary extract is based either upon decreased filtration through the glomeruli or by increase of urine resorption in the tubules. While other authors have shown the latter to be true, Poulsson¹ has demonstrated experimentally that decreased diuresis is to be attributed to increased back-diffusion of urea into the renal tubules. This, he contends, explains the fact that urea concentration in the urine is below that normally expected according to decreased flow of urine. Pellegrini,² however, believes that in some cases of diabetes insipidus the capacity of the kidneys to furnish a concentrated urine is diminished,

while in others water diuresis is increased. Three of the four patients he studied eliminated urine low in sodium chlorid content. He concludes that posterior pituitary exerts an action on water exchange between the blood and tissues, and also on the secretion of urine. In cases where reduction of urinary secretion did not occur, there was no increase in specific gravity of urine. One other investigation of the pathogenesis of diabetes insipidus is significant. Crăciuneanu⁶ et al. in Bucharest found a marked difference in the water exchange in a patient with this disease compared with normal individuals. They state that abundant diuresis during experimental thirst was the only factor in favor of a disturbance in the process of elimination. These workers conclude that the disturbances in water exchange in diabetes insipidus are probably the consequence of a dysfunction of the kidneys and other tissues.

Whatever the cause of increased urinary output and thirst in these patients, the symptoms require immediate relief. Posterior pituitary solutions, while not curative, do give material benefit as long as either injections or intranasal applications are continued. The following case cites our experience with the use of this extract, combined with other adjuncts, during a five months' period of observation.

REPORT OF CASE

A man, aged 26, was referred to us on August 1, 1932. He had suffered a left sacroiliac strain eighteen months before, and had received physiotherapy and worn a brace until recently. Aching pains in the sacroiliac region, after effort, continued, however. Two months ago excessive thirst began and he drank about 1½ liters of water every hour because his stomach "burned." Diurnal frequency occurred every hour, and nycturia every two hours resulted in the output of 25 to 30 liters of urine during twenty-four hours. No change in appetite was noted and no craving for sweets complained of. He had lost 10 kilos in weight during the past month. No familial history of diabetes was known. His past history revealed the habits of a normal unmarried young man. The only disease remembered was influenza in 1918 and again in 1923. Venereal infection was denied. He had fractured his right ankle in 1923, and a tonsillectomy was performed in the same year. His systems were negative. Maximum weight in 1926 was 80 kilos, average was 74 kilos, and at present is 64 kilos. General examination was essentially negative except that he was under normal weight for his height (172 centimeters), had a blood pressure of 106/74, and was slightly dyspneic on effort. Laboratory findings revealed a normal blood count, negative Wassermann and Kahn reactions, a normal stool, and a basal metabolic rate of ± 0 per cent. Fasting blood sugar was 220 milligrams per cent when first seen, and ten days later dropped to 138.9 milligrams per cent. The first speci-

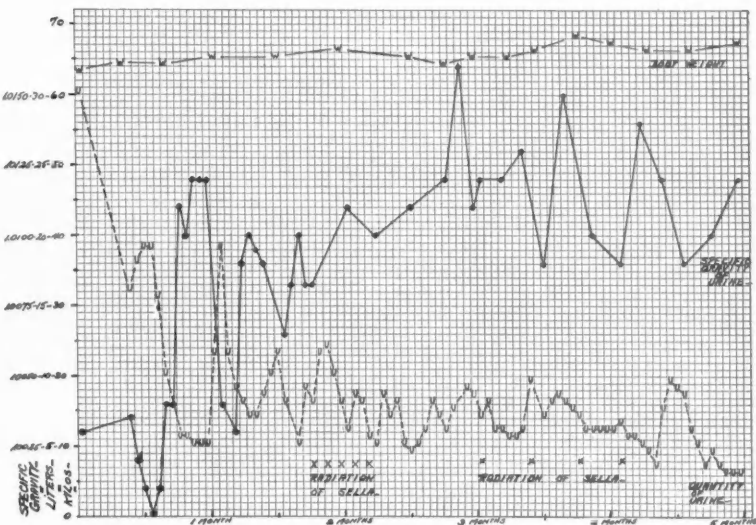


Chart 1.—Progress of patient under treatment for diabetes insipidus.

men of urine was clear, pale straw-colored, acid reaction, and the specific gravity was 1.003. Tests for albumin, sugar, acetone and diacetic acid were negative. The sediment was normal except for a few small clumps of bacteria. Roentgenologic examination of the sella tursica revealed that it was small and apparently completely bridged on the left side. There was no evidence of fracture, bony injury, or tumor.

Treatment consisted of giving the patient a low carbohydrate diet, administration of posterior pituitary by various routes, together with other adjuncts, with the results noted in Table 1. Pituitary extract orally did not decrease urine excretion, nor did local applications of pitressin to the nasal mucosa. A maintenance daily dose of one cubic centimeter of pituitary extract (twenty international units hypodermically) was required to give symptomatic relief. Toward the end of the second month of treatment, radiation of the sella was tried in an effort to further reduce water elimination. Five doses were given over a ten-day period with a satisfactory response, as noted in the table. A month later four more exposures (total of 3000 r on the right and 1500 r on the left) were made at ten-day intervals to the end of the fourth month, with a drop in urine output to four liters in twenty-four hours. At this time massage of the lumbar muscles was instituted, and the pelvic tilt was corrected by placing a lift under one heel. When last seen professionally the patient was excreting three liters daily and was symptom-free.

The specific gravity of the urine during our observation varied more or less inversely proportional to the quantity excreted. At the onset the specific gravity was from 1.000 to 1.003, and the urine output 20 to 30 liters daily. Marked fluctuation of specific gravity was noted during the treatment period, but at the end a rise to 1.012 occurred, while the urine excretion was reduced to about three liters. A slight increase in weight occurred.

Variations in blood pressure were noted with a gradual increase to normal (124/74) when last seen.

SUMMARY

Although the mechanism of action of posterior pituitary substance in decreasing water elimination in diabetes insipidus is not known, definite decrease in urinary output occurs when the extract is given hypodermically in this disease. The specific gravity of the urine is roughly inversely proportional to the amount excreted. One cubic

centimeter of the extract (twenty international units) was required daily to render a patient symptom-free. The adjuncts, *i. e.*, radiation of the sella tursica (even in the absence of tumor) and physiotherapy, were resorted to in the case reported. Our observations confirm those of Faelli,⁴ who found roentgen exposures of the hypophyseal region combined with posterior pituitary therapy more effective than exclusive treatment with pituitary alone.

350 Post Street.

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UNUSUAL EMBRYONAL DEVELOPMENT ERROR*

By W. A. SHAW, M. D.
Reno, Nevada

CERTAIN congenital deformities are more or less commonly seen in living infants, as club-foot, harelip and cleft palate, branchial cysts or fistulae, spina bifida and meningoceles, malformations of the genital and urinary tracts, as well as maldevelopments of the alimentary canal, imperforate anus, pyloric stenosis, and nonformation of various segments, and the like. Many more errors in development of the embryo are found in the dead fetus, such as absence of extremities, and monstrosities of various kinds.

The case I am presenting is apparently an error in development in one of the lower embryonal buds. According to anatomical authority¹ in embryology, the lower-limb buds commence as anterior and posterior folds at the lower end, or tail, of the embryo for the formation of the thigh and leg at about the third week of intra-uterine life. These folds and the forming limb bud should be approximately the same size on each side. The development of this part of the body occurs later than that of the upper portions of the body.

REPORT OF CASE

A baby girl, at present five months old, after an instrumental delivery at the hospital was found by the mother, upon the arrival of both at home, to have an inequality in the size and contour of the lower extremities. The baby was brought to me when about two months old. There was nothing unusual about the infant at this time except an apparent exophthalmos (which was found to be a family characteristic), a condition of protein and mineral deficiency in the diet, and an easily discernible difference in the lower limbs. Both limbs were apparently normal in development as regards bone and soft tissue structure. There was no evidence of lymph block, or of interference with the circulation anywhere suggestive of pseudo-elephantiasis or hyperplasia due to increased nutrition and stimulation of the affected area. The right lower part,

* Read before the thirtieth annual session of the Nevada State Medical Association, Las Vegas, September 29, 1933.



Fig. 1.—Showing asymmetry of extremities.

from the lumbar region down, was uniformly larger than the left, buttock, hip, labia, thigh, and leg. Measurements to contrast the limbs were taken as accurately as possible, and were as follows:

Left anterior spine superior to tip of fibula, 6 7/8 inches.

Right, 7 1/4 inches.

Left mid-thigh diameter, 4 15/16 inches.

Right, 5 7/16 inches.

Left calf, mid-diameter, 3 3/4 inches.

Right, 4 3/16 inches.

Figure 1 clearly shows the asymmetry in the limbs, both bone and soft parts; and there seems to be a difference in the size of the ilia as well.

The family history is essentially negative as to malformations or deformities in the past; there is a questionable history of tuberculosis in a maternal grandparent, while the parents of this child are both exceptionally well-developed, physically and mentally, and two sisters of the baby are strong healthy girls, with well-developed, sound bodies.

In the baby, the head, upper extremities, and other parts of the body seem to match with the left leg; the right lower part being definitely an error in development.

COMMENT

Many theories as to the etiology of such a condition may be drawn, such as endocrine unbalance, which does not seem probable when only one limb bud is involved. Circulatory nutritional disturbance, due to anomalous blood vessels, seems ruled out by the height of the disproportion, as well as the definite bone difference. It seems to be an original difference in the cells of the group forming the folds of the limb bud, or a difference in the reaction in the group to the cell growth-stimulating agency, whatever that may be.

It is reported that such errors in development sometimes affect one whole side of the body, one extremity, upper or lower, but, more usually, one lower extremity. I have been fortunate in seeing several such cases in this country and abroad. These individuals grow up and live normal lives without serious inconvenience, except from an esthetic standpoint. The difference in the length of the lower limbs is taken care of by pivoting and rotation in the hips, or by a built-up shoe on the shorter side. Usually the difference in the extremities is hardly noticeable when the parts are covered by ordinary clothing.

The treatment in the case presented has been improvement in general condition by supplementary feedings, increase in vitamin and mineral intake, and exposure to sunlight and the like, with excellent results; while the only treatment thus far instituted for the asymmetry in the limbs has been massage and exercise in the smaller portions, in so far as is possible in so small a child, while keeping the larger parts as quiet as possible. This treatment has been faithfully carried out by the mother with my help, and at present there seems to be some diminution in the asymmetry—in appearance at least. Later on, treatment by further stimulating the growth of the smaller limb is contemplated, by increased exercise, hyperemia, and electrical stimulation. In the future, if necessary or desired, one of the methods of increasing the length of long bones may be used, such as bone graft in the shorter femur; or by increasing bone growth through interference with the circulation in the metaphyses of the shorter femur and tibia by section through the medullary cavity according to the method recently described by Ferguson² in *The Journal of the American Medical Association*. I have been unable to find reports as to the results of treatment in such cases in the current literature.

A further report regarding this peculiar developmental error will be given after sufficient time has elapsed to deduce the value of various procedures.

Medico-Dental Building.

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Red Cross and Unemployment Relief.—More than two-thirds of the nation-wide system of Red Cross chapters and branches are today participating in unemployment relief. These include such activities as garment production and distribution, provision of hot school lunches and milk for needy children, family welfare work, aiding veterans of the World War and transients, promoting food conservation by canning the surplus products. The Red Cross has accommodated itself to the unusual needs of the times by extending its sphere of helpfulness and multiplying its deeds of mercy. The memberships of the American people, subscribed at the annual roll call, from Armistice Day to Thanksgiving, make possible this augmented service.

RUPTURED VENTRAL HERNIA

By H. M. GINSBURG, M. D.

Fresno

REPORT OF CASE

H. S., female, aged 47 years, was admitted to the General Hospital of Fresno County at 12:30 a. m., September 30, 1931. Patient did not speak English, and only the following history was obtained. A laparotomy was performed in 1929, following which there was a weakness in the abdominal wall at the site of the incision. About 3 p. m., September 29, 1931, while working in the grape fields, the patient felt a sudden "give" in her lower abdomen. Upon inspection she noted coils of intestines protruding from the skin. After consulting a physician she was brought to the hospital, a distance of forty-five miles. Upon her arrival, at 12:30 a. m., an examination revealed a well-developed, well-built female in marked pain, with about thirty inches of small intestines protruding through the skin and strangulated at the base. The intestines were black and dry.

Under ether anesthesia the skin, fascia, and peritoneum were incised and the strangulation freed. Using the aseptic technique, an end-to-end anastomosis was performed after removing about thirty-six inches of ileum. The excess peritoneum forming the hernial sac was removed, the abdomen was drained, and the peritoneum closed. The fascia was cleaned and overlapped with no apparent tension. Silkworm-gut sutures were used as retention sutures, and for the closure of the skin after the excess had been removed.

The patient was in shock immediately postoperative, with a temperature of 97 degrees centigrade and a pulse of about 78. Subcutaneous glucose, 5 per cent, and stimulants were given, and the patient was treated for shock. After twenty-four hours the patient's temperature was 101 degrees centigrade, but she required no narcotics, was voiding frequently in small amounts, and had a bowel movement—in all probability from material in the colon which had not yet emptied.

During the next seven days the temperature ranged between 98 and 101 degrees centigrade, and the pulse between 78 and 96. The dressings were changed frequently and the wound, on account of the foul odor, was irrigated with potassium permanganate. The patient was not coöperative, would pick the wound at all times, and was having daily bowel movements at this time. Except for a foul discharge from the wound, and a slight elevation of temperature to 101 degrees centigrade, she made an uneventful recovery. On October 19 all sutures were removed, leaving a superficial gap of the skin with slight drainage. Twelve days later the skin and superficial fascia were resutured and the patient, with no evidence of herniation and having normal daily bowel movements, was discharged on November 12, with the abdomen entirely healed. Examination months after discharge showed no changes.

Pathologic Report of Specimen.—Specimen consists of masses of skin and subcutaneous fat, and about thirty inches of intestines, mostly gangrenous with gangrenous mesentery. The mucosa is hemorrhagic and the lumen of the bowel contains much free blood.

COMMENT

The case report is presented because of the unusual occurrence. There must have been a thinned-out, well-developed ventral hernia, to allow the intestines to perforate the skin with the usual intra-abdominal pressure. Fortunately the intestines were not perforated during the elapsed time from occurrence to operation. The resistance of this individual was sufficient to ward off the severe peritonitis which ordinarily would have developed.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussions invited.

ROUTINE PRECAUTIONS IN SERTHERAPY

ETIOLOGY AND PATHOLOGY OF SERUM SICKNESS

ALBERT P. KRUEGER, M. D. (Department of Bacteriology, University of California, Berkeley). Serum sickness is such a common sequel to the use of antisera of all sorts that a discussion of the subject, even from the viewpoint of theoretical immunology, is germane to the daily experience of the practicing physician.

Serum disease may be divided into two general types. First, the simple exanthem of protean character (urticarial, morbilliform, or scarlatinale), accompanied by fever, painful swollen joints, lymphadenitis, and a moderate degree of albuminuria with, less frequently, some degree of polyneuritis, myalgia, peripheral nerve paralysis and persistent arthritis. This, the common form of the disease, occurs six to fourteen days after the administration of serum, although it may very rarely follow immediately upon serum injection. The symptoms may recur without further injections at intervals of two to five days, and there are recorded as many as four separate eruptions after a single injection.

As to incidence, it may be categorically stated that the larger the amount given, and the more rapid the absorption into the blood stream, the more frequently does the disease appear. The data given below are tabulated from several sources and show the tremendous variation in incidence following single injections of varying quantities of antitoxic sera.

Statistically, the practitioner may assume that following the administration of moderate amounts of purified and concentrated serum given intramuscularly, one in five patients will manifest the disease. This compares most favorably with the earlier figures of 50 to 90 per cent incidence noted with whole horse serum before the purification technique had been developed.

The second and more malignant form of serum sickness fortunately occurs infrequently, and is

characterized by acute shock with anxiety, pallor, dyspnea, rigors, and a rapid and feeble pulse; and is sometimes accompanied by vomiting, diarrhea, and a rapidly progressive edema of the face, pharyngeal tissues and lung. The outcome is occasionally fatal.

This more violent manifestation of serum sickness has its onset immediately following intravenous or intraspinal injections of sera, although the literature contains accounts of its occurrence even after subcutaneous administration. Rarely may the onset be delayed until the appearance of the exanthem.

The physician may expect an incidence of one case of the fatal acute form per one hundred thousand serum injections. The immediate or delayed local reaction not infrequently takes the form of an extensive necrosis at the site of injection, corresponding closely to the Arthus phenomenon seen in experimental animals.

In considering the etiology of serum sickness one might be tempted, as a first approximation, to call the syndrome the exact analogue of anaphylaxis in experimental animals; but such is not altogether the case. In the first place, the symptoms most often follow a first injection of serum with an interval varying from a matter of minutes to some ten days. There is, thus, no sensitizing dose as in animals. Again, one would postulate an immediate anaphylactic response upon successive injections of serum if we assume the mechanism to be a truly anaphylactic one. All the essentials for the reaction are present, that is, there is precipitin free in the blood stream, and corresponding antigen is introduced. Yet immediate symptoms are very rare and some data indicate that serum sickness after a second injection of serum occurs less frequently than after a first. It is obvious, therefore, that certain objections must be overcome before the clinical and the experimental pictures may be considered analogous.

It may be well to summarize available data before attempting to depict the mechanism involved in the production of the clinical syndrome.

(a) Symptoms are due to the foreign serum *per se* and not to the antibody content; for the disease may be produced with sterile normal horse serum. Further, immunization with antigens resulting in the production of antibodies in the blood stream does not increase the percentage incidence of serum sickness.

(b) The symptoms are more apt to be produced by the serum of certain horses than by identically prepared serum from other horses. The variation in incidence with serum from different horses

TABLE 1.—Incidence of Serum Sickness as Related to Amounts Administered

Volume of Serum	Percentage Showing Reaction
1-10 ml.	10
10-20 ml.	30
20-30 ml.	30
30-50 ml.	42
50-100 ml.	55
Over 100 ml.	70

varies from 20 to 90 per cent. This cannot be entirely controlled by pooling sera, for with such preparations the incidence will vary from 30 to 60 per cent.

(c) Concentrated serum is not so apt to produce serum sickness as whole serum, primarily because such sera may be given in smaller amounts and the total dose of foreign protein is consequently lessened. Also purified sera are antigenically less complex, since they consist of the pseudoglobulin fraction alone with the euglobulins and albumins removed.

(d) Horse serum fibrinogen is not the responsible etiologic agent.

(e) Active sensitization against horse serum can be produced in humans, as indicated by skin tests conducted before and after immunization with toxin-antitoxin.

With the clinical picture of serum disease in mind, and also considering the data mentioned above, we cannot state that the syndrome is explicable upon the same relatively simple basis as anaphylaxis in experimental animals. It is possible that the exanthem and accompanying clinical phenomena represent the typical human anaphylactic response which, for its development, requires well-defined quantitative and localizing conditions; as, for example, fixation of precipitin in epidermal cells. In addition man may possess, as do certain other animals, an inherent refractory state to the development of anaphylaxis, and it is likely that sensitization follows upon contact with horse proteins through channels other than direct injection. It would be said, then, that in the common form of the disease the foreign protein constitutes an antigen, and causes the production of antibodies while itself remaining in considerable concentration in the blood stream. When the antibodies have reached a certain critical concentration, the typical reaction occurs and symptoms follow. Upon these assumptions, which rest for the most part upon experimental evidence, it would be possible to explain the clinical manifestations and variations of serum disease as merely special cases of an antigen antibody anaphylactic reaction.

The pathologic changes in serum disease may be briefly disposed of. The swollen joints are usually not red nor do they show any increased temperature. The joints seldom contain free fluid and the swelling may be explained on the basis of periarticular edema. The fluid found in the joint cavity in the exceptional case shows the cytological findings of an acute arthritis, and in such fluid horse serum has been demonstrated. The local changes may then be due to synovial irritation from the localized foreign protein.

The regional lymph nodes, especially those nearest the site of injection, usually become swollen and tender quite early in the course of the disease, and similarly they regress early. This again is largely an edematous swelling which practically never progresses to suppuration. Exceptionally the spleen may become palpable.

The face, more particularly the eyelids and, in addition, the dependent parts of the body, often

show a well-defined edema which is apparently not of renal origin but rather due to local changes in vascular permeability. It is not unusual to find signs of transitory renal irritation which for the most part, appear after the edema is established. During the first few hours of serum sickness there is apt to be a slight leukocytosis, with a moderate increase in the lymphocytes. As the syndrome progresses, the picture changes to a leukopenia, frequently accompanied by a mild eosinophilia.

In summarizing, one would conclude that serum disease is exceedingly protean in its manifestations, that its incidence and severity are related to the amounts of serum injected, the route of injection and the antigenic complexity of the serum used; and finally, that the syndrome is probably explicable as a special case of an anaphylactic reaction.

* * *

TREATMENT AND PRECAUTIONS IN ADMINISTRATION OF SERUM

EDWARD B. SHAW, M. D. (384 Post Street, San Francisco).—The therapeutic use of serum in human beings is frequently followed at varying intervals by reactions which are, in general, no more than annoying, but are occasionally so distressing or dangerous as to necessitate weighing the benefits of serum therapy against these possible adverse effects. Such reactions include those due to nonspecific protein effect, and those in which specific hypersensitiveness is concerned.

Nonspecific Reactions.—The injection, especially intravenously, of any protein or protein-like material, serum, vaccines, pollen solutions, proteose, etc., is frequently followed in a few minutes by a reaction of varying severity. Adults are commonly more affected than children. There is commonly a rise of pulse and temperature which is sometimes to extreme heights, accompanied by chills, convulsions, nausea, vomiting, and prostration. The patient is frequently wretchedly uncomfortable, but there is usually little cause for concern unless the patient's antecedent condition is of such gravity as to impair his ability to withstand such a reaction.

Care in preparation of serum helps in the prevention of these occurrences. The blood of certain horses is more productive of reactions than others, and these should not be used as serum producers. Proper ageing, concentration, and clarification of serum are important.

Intravenous therapy is more dangerous and should be reserved for more serious conditions. When serum is thus employed it must be perfectly clear, should be warmed to body temperature and given very slowly. The coincident injection of dextrose solution has a protective effect.

The chills, hyperpyrexia, and general discomfort are treated symptomatically. Ice caps, cool baths, and continuous, cool colonic saline flushes help reduce the fever. Barbiturates, codein, or morphin are required for sedation. Epinephrin has no place in the treatment of this condition:

it does not serve to ameliorate the symptoms, and it adds to the tachycardia and general discomfort of the patient.

Specific Reactions.—A second group of reactions is due to specific horse serum hypersensitiveness. These reactions may be further divided into two groups—immediate reactions and delayed reactions.

Immediate reactions promptly follow serum administration. They are most violent after intravenous injection; but symptoms may appear after the introduction of a very small amount of serum, and fatal results have followed even subcutaneous reactions. Symptoms closely resemble anaphylactic shock in the guinea-pig; the patient is apprehensive, the skin tingles, urticaria may appear, there is increasing dyspnea, stridor, cyanosis, and finally death results from respiratory failure; or recovery may slowly occur with or without treatment. The picture is so similar to that of anaphylaxis that sometimes the phenomena are assumed to be identical. There is little doubt that the processes are not identical, but certain points of resemblance as well as certain differences are noteworthy clinically.

These reactions resemble anaphylaxis in their symptomatology, in the fact that other evidences of the patient's horse serum hypersensitiveness can often be discovered, and also in the fact that epinephrin is almost specific in the control of symptoms.

The differences between the experimental and clinical phenomena must be no less carefully noted:

1. Patients who develop anaphylaxis-like shock are frequently those with no history of previous serum injection. Unlike the experimental animal which is sensitized by the injection of a small amount of the specific protein at an interval prior to the shocking injection, the mechanism of sensitization in human beings often cannot be determined, and apparently in some cases is a constitutional factor which is unaffected by the patient's environment. Doubtless sensitization occurs in other ways than by injection, but some individuals are profoundly horse serum sensitive without any known previous contact with horse proteins.

It has been denied by some that human beings can ever be artificially sensitized to foreign protein, and it is certain that some individuals fail to exhibit any adverse reaction from several injections of serum at varying intervals. It is hardly less certain that other patients are rendered mildly, or sometimes profoundly, sensitive to horse serum after receiving one or more injections, and thereafter react more or less violently to subsequent injections. Single injections are less apt to sensitize than repeated ones, and such a procedure as the administration of three or four doses of T. A. T., which contains minute amounts of horse serum, at intervals of one or two weeks, is more likely to increase the hazard of a later injection of serum than is, for example, a single prophylactic dose of diphtheria antitoxin.

2. The sensitized guinea-pig can be protected from fatal anaphylaxis by the injection of a very minute dose of the specific protein. This produces very mild shock, from which the animal quickly recovers; and subsequently the animal is, for a time, incapable of the typical response to the injection of a large amount of the protein. In the treatment of sensitive patients attempts are made to utilize the same protective mechanism, the method of desensitization being an effort to produce this state of anti-anaphylaxis. Human behavior herein departs from the laboratory analogue in that the sensitive patient is not invariably protected from severe reaction by the administration of minute or graduated doses of serum. In fact, it is not certain that such a method ever protects. Nevertheless, good clinical practice supports such a procedure, even though it is not invariably successful; it is unquestionably advantageous to observe the effect of initial small doses of serum on the sensitive patient, whether or not they protect him against subsequent larger ones.

Precautions.—When serum is to be given, certain precautions are essential. These measures are particularly important if the intravenous route is to be employed.

History. A careful history regarding hypersensitiveness should be secured as a preliminary. Patients who are allergic to various substances, as indicated by attacks of asthma, hay fever, eczema, and urticaria should be regarded with suspicion. Inasmuch as horse serum is most commonly used, those who are sensitive to horse hair, horse dander, and horse serum, are the subject of gravest concern. These individuals, horse asthmatics, commonly develop asthmatic symptoms when in the vicinity of a horse and cannot ride upon or behind a horse in comfort; one such patient developed severe asthma from horse manure spread on the lawn outside his window. Most horse asthmatics are so extremely sensitive to all horse proteins that they cannot be given horse serum without extreme risk; but a few are so specifically sensitive to cutaneous emanations that serum does not produce a response.

A history of previous injections of (horse) serum is suggestive, although not necessarily productive of hypersensitiveness. Toxin-antitoxin is particularly apt to sensitize, but toxoid, which contains no serum, does not sensitize, and injections of vaccine are, of course, not significant.

Tests for Hypersensitiveness. In every case in which the history is suggestive, tests for hypersensitiveness should be conducted as a preliminary to treatment. It is not amiss to test every case if time permits.

The simplest test consists of the application of a drop of undiluted serum to a superficial scratch on the skin. In sensitive patients a definite reaction usually appears in less than thirty minutes, in the form of an urticarial wheal surrounded by a zone of erythema. The size and promptness of appearance of a reaction is roughly parallel to

the degree of sensitization. A few individuals are generally hypersensitive but lack skin sensitization, so that the absence of a skin reaction is not absolute evidence of safety; a positive skin reaction, however, is a significant warning.

The intracutaneous test is a more refined method, which at the same time introduces some risk of a general reaction. This consists of the intradermal injection of one-tenth cubic centimeter of a one to one hundred dilution of serum in normal saline. A positive reaction appears in from ten to forty minutes, and is similar to the foregoing.

The ophthalmic test consists in applying upon the conjunctiva a drop of diluted or undiluted serum. A reaction consisting of reddening and injection of the conjunctiva appears in a few minutes. When this reaction has definitely appeared, it should be promptly neutralized by the instillation of one to one thousand epinephrin solution, lest ulceration of the conjunctiva be produced.

Desensitization. In all cases in which history or tests indicate the possibility of reactions, the first dose of serum should be very minute, succeeding doses may be given at intervals in increasing amounts, while observing the local and systemic effects of previous doses. This is, of course, an effort to apply the phenomenon of anti-anaphylaxis to clinical use. Many good observers feel that desensitization is a futile gesture, which confers no real protection and is directed against an accident which seldom occurs; nevertheless, it affords a certain degree of safety, and at least permits the clinician to observe the results of minute doses before undertaking the injection of larger amounts.

Desensitizing injections should be made subcutaneously, or subcuticularly, *in an extremity* in such a location that if a generalized reaction occurs a tourniquet may be applied proximal to the site of injection so as to impede absorption. As far as possible all injections of serum should be in a similar location, so that if the necessity arises absorption may be caused to proceed slowly.

The amount of serum first administered should be based on the history and the skin reaction. In very sensitive cases one-half cubic centimeter of a one to one thousand dilution is given, less sensitive cases receiving a one to one hundred or one to ten dilution. Subsequent doses, and the interval between doses, may be decided upon by the response to previous injections. Commonly, injections may be repeated every thirty to forty minutes, using one-half cubic centimeter of 1 to 1000, 1 to 100, 1 to 10, and undiluted serum, following this with the entire dose intramuscularly.

Administration. The intramuscular route meets most requirements for therapy and should usually be employed. The subcutaneous route permits slower absorption and should be reserved for prophylactic serum. The intravenous route is most dangerous, and reactions from its use are most difficult to control. It should be used only for

more serious illnesses, which call for serum therapy as an emergency measure, and should very rarely be employed if there is significant evidence of hypersensitiveness. If in the serum-sensitive patient the need for intravenous therapy seems definite, the above desensitizing procedures should be carried out, and then serum given intravenously in similar amounts and in similarly graduated dilutions.

Dextrose solution injections are an important adjuvant to serum therapy. Not only do these reduce protein reactions, but they help to prevent anaphylaxis-like reactions. When serum is to be given intravenously the dextrose solution may first be started, small desensitizing amounts of serum injected along with the dextrose, and finally the flow of the dextrose interrupted by the introduction of serum, which is, in turn, followed by more dextrose.

Treatment of Shock. Serum must never be given in any manner without having epinephrin solution at hand for instant injection. If signs of anaphylaxis-like shock appear, further absorption should be impeded, if the site is accessible, by a tourniquet, and the patient given epinephrin (1 to 1000) in physiological amounts—enough to cause blanching of the lips and acceleration of the pulse. Injections of epinephrin may be repeated; but dangerous symptoms are a matter of a very few minutes and must be promptly combated.

Morphin and other opiates are sometimes advisable in the treatment of prolonged reactions.

Delayed Reactions.—At intervals of three to ten or more days after serum injection, delayed reactions appear which are somewhat similar to immediate reactions, but are spread over a longer period of time and are much less violent or dangerous. The chief symptoms consist of urticaria, which may be most intolerably profuse and persistent; joint swellings, angioneurotic edema, enlargement of the lymphatic glands, and a variety of rashes of a general urticarial nature.

The reactions are caused to appear earlier after injection, and to be more violent, as a result of the factors which favor immediate reactions. A satisfactory clinical explanation of these symptoms is that they appear as a result of serum sensitivity that develops after, and as a result of the injection of serum. When this augments an existing slight degree of sensitivity, the resultant symptoms are caused to appear earlier and more violently.

The symptoms which appear at such an interval are rarely dangerous, but expose the patient to extreme discomfort. The injection of epinephrin will relieve symptoms, but after a short while they usually recur. Small injections of this drug may be given frequently or injections may be given at wider intervals; and as symptoms recur between injections, the site of the last injection may be gently massaged with resultant liberation of small amounts of epinephrin from the site of injection into the circulation. Ephedrin by mouth produces little relief.

Nursing care is of great value, and constant attention should be directed toward the patient's comfort. The frequent application to the superficial skin lesions of a variety of remedies affords relief. For this purpose calamin lotion may be used with the addition of menthol, alcohol, or phenol (phenol must be used with care, for extensive applications, in children); witch-hazel, alone or in combination with bicarbonate of soda; cooling baths with the addition of magnesium sulphate or bicarbonate of soda; iced compresses of solutions of boric acid, soda, or magnesium sulphate, or the application of ointments containing minute amounts of the synthetic local anesthetics.

The attendant itching, pain, irritability and restlessness of these patients is very difficult to relieve, and symptoms may be prolonged over many days. Sedatives, hypnotics, or opiates need to be freely used, as the patient's discomfort is altogether disproportionate to the lack of real severity.

* * *

TREATMENT OF ACCIDENTS INCIDENT TO SERUM THERAPY

CLIFFORD SWEET, M. D. (242 Moss Avenue, Oakland).—Accidents incident to serum therapy should, so far as is possible, be prevented. No patient should be given serum until he has been studied to determine whether or not he is hypersensitive to the serum that is to be given. A careful history should be taken to determine whether or not there have been allergic states in related members of the family, and especially whether or not the patient has previously had asthma, hay fever, urticaria, eczema or other allergic attacks. A negative allergic history should never be accepted as evidence that the serum may be safely given, nor should a positive history be considered a contraindication to its use. A positive history may well emphasize the need for caution, but a negative history should never allow any decrease in the thoroughness of the preliminary study. A previous injection of horse serum, especially since so many children have had diphtheria toxin-antitoxin, and prophylactic tetanus antitoxin should be noted as having possibly established a state of hypersensitivity. The patient's reaction to the former injection of serum is of interest, but may not be accepted as indicating his present state of reactivity.

Every patient should be skin-tested with the serum to be used before it is injected. The few minutes required for this test will not delay needed treatment, and its use will decrease unpleasantly severe and at times fatal reactions to serum. If there is reason to believe that a severe state of hypersensitivity exists, the scratch test with serum diluted one hundred to one thousand times with salt solution should be done. If this is negative, after twenty to thirty minutes 0.1 cubic centimeter of serum the same strength should be injected intra-, not subcutaneously. The injection of 0.1 cubic centimeter of dilute serum subcuta-

neously into a patient who is markedly hypersensitive may cause a severe or even fatal reaction. The idea that one may safely inject 1 cubic centimeter of undiluted serum subcutaneously as a test dose, and as a means of desensitizing the patient, is a dangerous one and should long since have passed out of practice. Intracutaneous injection should be done with the bevel of the hypodermic needle turned toward the surface of the skin in order to avoid the danger of unintentional subcutaneous injection.

If after an interval of fifteen or twenty minutes there are no urticarial pseudopodia about the site of the intracutaneous injection, 0.1 cubic centimeter of undiluted serum may be quite safely injected subcutaneously. Then if no symptoms develop, the entire dose may be injected subcutaneously, intramuscularly, or intravenously. If the injection is given intravenously, it should be given very slowly, and an additional factor of safety is added by diluting the serum with five to ten volumes of 5 to 10 per cent glucose solution, the mixture to be given slowly over a period in excess of fifteen minutes. However, if an urticarial wheal, especially one having pseudopodia about it, arises at the site of the intracutaneous test, the serum must then be given very cautiously in gradually increasing, divided doses over a period of four, five or six hours. For a patient who is evidently hypersensitive, one-tenth cubic centimeter of a 1 to 1000 dilution of the serum should be given subcutaneously. If a reaction of any moment occurs, it should be controlled with an injection of adrenalin, and after the lapse of twenty to thirty minutes the same dose of serum should be repeated. However, if the first subcutaneous injection (one-tenth cubic centimeter of serum diluted 1 to 1000) produces no reaction, a like amount (0.1 cubic centimeter) of serum diluted 1 to 100, 1 to 10, and undiluted, may be injected subcutaneously at intervals of twenty to thirty minutes. If no reaction is produced by the above injections, one-half and then one cubic centimeter may be injected during the next hour, followed by the remainder of the whole amount in divided doses during the next hour or two. However, if any of the doses on the above schedule produce a reaction of any severity, the same or a smaller dose should be used for the following injection, and increases made as gradually as may be necessary for the welfare of the patient, even though an entire day's time be required for the completion of the treatment.

Until one is certain that the patient is not dangerously hypersensitive to the serum, all subcutaneous or intramuscular injections should be made in an extremity so that absorption may be delayed by the application of a tourniquet proximal to the site of injection, should a reaction occur.

When giving serum, a fresh active solution of adrenalin should always be ready for immediate injection to relieve any symptoms that arise. Incidentally, if severe symptoms do arise, such as diffi-

culty in breathing, adrenalin should be given until relief is obtained. Often the failure to obtain relief from the injection of adrenalin is due to an inactive solution, but more often because an insufficient amount is injected. If the adrenalin solution is injected quickly, the greater part of it remains at the site of the injection, and is then released slowly by gentle massage or quickly by vigorous massage of the tissues which contain it. Pallor of the lips is the first dependable sign that an adrenalin effect has been obtained, and until this sign appears sufficient effect for relief of serious serum reaction has not yet occurred. The danger that one may give an overdose of adrenalin can be well guarded against by giving the injection in an extremity and then applying a snug tourniquet proximal to the site of the injection, whenever it is desirable to halt further absorption.

The patient who has been injected with serum should remain under close medical observation for at least one hour following the injection. Delayed reactions of serious grade are of sufficiently frequent occurrence to make this precaution imperative.

Serum Sickness. Patients should be warned that serum sickness may follow the injection of serum after the lapse of hours, or even as long as ten days. This warning should describe the fever, joint pains, and especially the outbreak of urticarial skin lesions that usually are its manifestations. By so warning his patient, the physician not only averts unfair criticism from himself, but also assists in educating the medical public concerning the whole matter of serum reaction, at the same time sparing his patient needless alarm.

The injection of adrenalin (1 to 1000 solution) is the only reliable means of giving direct relief to the patient suffering from serum sickness. The relief obtained from adrenalin is transient, but may be renewed from time to time over a period of twelve to eighteen hours by massage at the site of injection, provided a reasonably generous amount of adrenalin (0.5 to 1 cubic centimeter 1 to 1000 solution) has been injected. Relief from the intense itching of particularly troublesome areas of urticaria can be obtained by the local application of adrenalin to the affected area. Acetyl salicylic acid (aspirin) in adequate dose (0.3; [grains 5] at age six years) once in three or four hours should be given for relief of discomfort, while tub baths as hot as can be borne, to which liberal amounts of sodium bicarbonate have been added, usually allay the itching. Barbituric acid derivatives, such as phenobarbital, amytal, and sodium amytal, should be used to prevent disturbance during the sleeping hours. Treatment is of no avail except that the patient can be spared discomfort. Fortunately serum sickness is self-limited, and even though it may last several days, leaves no aftermath. Consequently, if the attending physician can persuade his patient that the benefit obtained, or the danger avoided is well worth the price of even a severe attack of serum sickness, all is well.

What Medical Care Costs the Average Family.—That the cost of medical care varies from zero in some families to more than the entire year's income in others is the general conclusion drawn from a survey of sickness costs among 36,000 Metropolitan Life Insurance Company employees and members of their immediate families. The highlights of this study are presented in summary form in the November issue of *The Modern Hospital* and the findings compared* with those of the Committee on the Costs of Medical Care (C. C. M. C.) which conducted a similar study of the annual costs of sickness among representative population groups.

Although records were received covering the costs of sickness for 120,334 persons, the survey cannot be said to cover 120,000 years of life. In the first place not all employees were in active service during the entire period in review and in the second place the study of family expense was limited to "natural"† families. Altogether there were 96,000 person-years of life exposed, of which approximately 34,000 were used in the study of costs for total families.

Since the employees live in the more thickly populated sections of the country the survey represents essentially an urban rather than a general population group. No returns from rural areas and few from towns of less than 5,000 were received.

The known incomes of the families were above those of the general population, 85 per cent of the annual incomes for the "natural" families falling into the \$2,000 to \$5,000 group.

Considering the proportion of families receiving certain types of medical care, the results of the Metropolitan and of the C. C. M. C. studies were remarkably similar. In both cases approximately 85 per cent of the families reported doctors' services, approximately 50 per cent dental service and 20 per cent hospital treatment. Among Metropolitan families, 89.1 per cent purchased drugs, 8.8 per cent paid for nurses' service and 21.5 per cent reported oculists' service. Among C. C. M. C. families, on the other hand, these percentages were 97.0, 17.3 and 13.4, respectively. This discrepancy may be explained by the difference in technic used in the two surveys.

Cost Varies Directly With Family Income.—That the cost of medical care varies directly with family income is confirmed by the Metropolitan and the C. C. M. C. findings. About 3.0 per cent of income was expended on medical care regardless of size of family, the per capita costs decreasing from \$47.01 in families with no children to \$13.44 in families with six or more children. In three-fourths of the cases of sickness studied individually, the expense per case was less in families with six or more children than in families with no children or with only one child.

The Most Frequent and Most Expensive Causes of Illness.—In both investigations it was found that the minor respiratory diseases and care of the teeth were the primary factors in sickness costs. Conditions responsible for the largest combined expense in order of importance were care of the teeth, puerperal conditions and minor respiratory conditions. The most expensive single illnesses were due to diseases of the bones, cancer, diseases of the lungs, hernia and intestinal obstruction, tumors, appendicitis, ulcers of the stomach and intestines, and goiter.

Costs of Hospitalized Illness.—The average expense of a case of hospitalized illness was \$163. Actually, the illnesses varied in cost from less than \$10 to more than \$5,000 per case. In one-third of the cases the expense was greater than the average, in one-quarter greater than \$200, and in almost one-fifth larger than \$250 each.

In one-quarter of the cases hospitalized illnesses accounted for 90 per cent or more of the total family expense for medical care, in two-fifths for 80 per cent or more and in two-thirds for 50 per cent or more.

* Comparison is made between the Metropolitan crude results and the C. C. M. C. results adjusted for standard income and size of community distributions.

† A family consisting of husband and wife, or of father, mother and children, the head of which had been in continuous service with the Metropolitan for approximately two years.

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 preparation of manuscripts and of illustrations. It is suggested
 that contributors to this journal write to its office requesting
 a copy of this leaflet.

EDITORIALS*

THE NEW YEAR

California and Western Medicine Extends Greetings.—The financial clouds which have hovered over our country since 1929 have not yet lifted, even though occasionally it does seem that the sun is striving earnestly to break through and shed its warmth and light. All classes of citizens have suffered during these many depressing months; and as a class, few in greater proportion than members of the medical profession. Physicians everywhere have been called upon to work as hard or harder than ever, even though they knew that for much of their labor there would be little or no financial reward. Under these discouraging conditions, the traditions of medical service have been a real inspiration, for these have rendered it possible for medical men and women to make easier the work of carrying on, and the workers, as well as those served, that much the happier.

Signs point to a real, even though perhaps only gradual, improvement in the industrial and other activities of the people of the United States.

*Editorials on subjects of scientific and clinical interest, contributed by members of the California Medical Association, are printed in the Editorial Comments column, which follows.

CALIFORNIA AND WESTERN MEDICINE, therefore, joins with the members of the California Medical Association in hoping that this new year will witness a dissipation of much of the gloom and sorrow long so much in evidence; and, at the beginning of 1934, this JOURNAL extends to its readers, one and all, the best wishes for the year to come.

FEDERAL FOOD AND DRUGS ACT—U. S. SENATE BILL 1944 (COPELAND)

What Senate Bill 1944 Aims to Accomplish.—Senator Royal S. Copeland of New York has pending in the United States Congress, at Washington, Senate Bill 1944, the objects of which are:

"To prevent the manufacture, shipment, and sale of adulterated or misbranded food, drugs, and cosmetics,* and to regulate traffic therein; to prevent the false advertisement of food, drugs, and cosmetics, and for other purposes."

This bill aims to supplant the present Pure Food and Drugs Act, which became a law (its field of application being limited to interstate shipment of foods and drugs) in 1906, some twenty-seven years ago. That original bill, which was brought into existence largely through the efforts of the late Dr. Harvey W. Wiley, has for a quarter of a century been the only federal bulwark against the sale of impure and dangerous foods and drugs. It is now proposed to amend it by rewriting it and adapting it to the needs of the present day; for in the last twenty-five years the Food and Drug Administration of the United States has learned much concerning the weaknesses of the 1906 Wiley law, beneficent though it was.

The proposed Pure Food and Drugs Act, like the original Wiley law, has two major purposes: one, the protection of the purchasing public; the other, safeguarding the interests of legitimate industry that produces and distributes drugs and foods.

* * *

The Opposition to Senate Bill 1944.—The two aforementioned aims are so worthy of acceptance that it is more than astounding that a strenuous opposition and lobby should be found already existing and arrayed against the measure. The explanation of this is simple. The reason the Copeland bill is being fought is due to the fact that those interests which have been making large fortunes through the production and distribution of impure and mislabeled drugs and foods are willing to spend additional large sums of money to perpetuate their nefarious activities. Members of the medical profession, because of their training and their knowledge of drugs, more than any other class of citizens can appreciate why lay citizens should be protected from such impure and dangerous products. On that account, they should give active support to Senate Bill 1944 (Copeland).

*Editor's Note.—The insertion of cosmetics into the title of the bill is an innovation. To those to whom such insertion may seem strange, it may be in order to quote from a recent article by Jeanette Eaton in *Harper's*: "Feminine beauty, once the Creator's business, is now Big Business. American women spend well over \$2,000,000,000 a year on cosmetics."

In the hearings on the Copeland Bill, recently held before a Senate subcommittee and accounts of which have appeared in the public press, the hand of some of the selfish interests opposing Senate Bill 1944 may be plainly noted. Appended to these comments are excerpts, explanatory of some of the purposes of Senator Copeland's measure in so far as drugs are concerned; and the viewpoints there expressed should have the approval of practically all physicians.

* * *

Senator McNary of Oregon Opposes the Bill.—

According to newspaper reports, for example, one of those who is fighting the Copeland Bill is Senator Charles L. McNary of Oregon, who seems to have closed his eyes to the fundamental purposes of Senate Bill 1944, and to the difficulties which have been encountered in enforcing the Wiley Bill of 1906. Seemingly, Senator McNary cares more about the secondary legal procedures, when appeals from the Federal Food and Drug Administration's rulings are taken to the courts, than he does about the protection of innocent lay citizens from impure drugs and foods, or about safeguarding the legitimate merchants who desire to deal only in pure drugs and foods. Our medical colleagues in the State of Oregon, therefore, may perform a real service to the people of the United States if they can show Senator McNary where he seems to be in error in fighting a measure which so aims to promote the best public health interests of the nation.

* * *

How California Medical Association Members Can Aid.—

Members of the California Medical Association are urged to write to Senator Hiram Johnson or Senator William McAdoo at Washington, requesting a copy of Senate Bill 1944 (Copeland). The United States Food and Drug Administration, Washington, D. C., also has a series of articles on Senate Bill 1944, which will be sent free of charge on application. It is hoped that the secretaries of component county medical societies and of the county woman's auxiliaries will write for this literature, and make report thereon to their respective organizations. Action favorable to Senate Bill 1944 should be communicated to Senators Johnson and McAdoo, and to local congressmen. Such cooperation will aid greatly in overcoming the violent onslaught that is almost certain to be made by selfish and vicious interests, which may be depended upon to becloud, as much as possible, the real issues, both in committee and when the bill gets on the floors of the Senate and the House.

* * *

High Points of Senate Bill 1944.—A summary of what Senate Bill 1944 (Copeland) aims to do includes the following items:

1. Prevention of false advertising of foods, drugs, and cosmetics;
2. Prevention of traffic in poisonous cosmetics;

3. Establishment of safe tolerances for added poisons in food;

4. Establishment of legally binding definitions and standards for foods;

5. Power to require permits for manufacture of potentially dangerous products when public health cannot otherwise be safeguarded;

6. Prevention of curative claims for drugs when such claims are contrary to the general agreement of medical opinion;

7. Requirement for definitely informative labels for foods and drugs; and

8. Power to protect the public health from future products and practices which may prove dangerous.

* * *

The Drug Aspects of Senate Bill 1944.—In an excellent article printed in the *Oil, Paint and Drug Reporter* of November 27, 1933, Mr. Walter G. Campbell, Chief of the United States Food and Drug Administration, discusses at some length "The Drug Aspects of Senate Bill 1944 (Copeland)," from which document are quoted these pertinent paragraphs:

"I shall begin this discussion of the drug aspects of the Copeland Bill with the destruction of a popular fallacy. This fallacy is that there will be set up in the United States Department of Agriculture a czaristic authority having the power of life and death over the drug and cosmetic industries, and that the constitutional right of trial by jury will be denied. There never was anything more ridiculous nor unfounded.

"What has given rise to such a delusion? The answer is doubtless to be found in the final sentence of Section 23, which reads, 'The findings of fact by the Secretary of Agriculture shall be conclusive if in accordance with the law.'

"There are eighteen words in this sentence, but I can only conclude that a good many people have never read past the first dozen. 'If in accordance with the law,' is the important phrase. Whenever 'the findings of fact' are brought before the court for review, and are found to be arbitrary, capricious, or unsupported by evidence, they will be overturned. At all times the secretary's regulations, under the new bill, as under the present law, are subject to court review and will become invalid if found unreasonable or arbitrary. Since the courts can review every administrative act, it is obvious that there is no transference of power from the courts to the administrative branch of the government.

"So much for the misconception that the Copeland Bill will make the Secretary of Agriculture an autocrat of the medicine cabinet and the dressing table.

"Another fallacy that we might as well do away with is that the new bill denies the right of self-medication. The bill recognizes the right of self-medication. Furthermore, it recognizes the right of every person who medicates himself to know what he is buying, as well as to receive competent directions for using what he buys so that it will not endanger his health. The Copeland Bill is interested only in giving the consumer a chance to know the truth about the medicine he takes, and to protect him against preparations which are dangerous when taken in accordance with the directions on the label. If the Copeland Bill did not recognize the right of self-medication, many of its provisions would be unnecessary.

"Number three in our list of popular fallacies about the Copeland Bill is that it will work against the public by requiring the disclosure of proprietary medicine formulas. . . .

"Contributions from therapeutic research are covered by patent laws, which fully protect anything new or novel about a drug product itself, or about the process for the manufacture of a drug product.

Furthermore, it is almost impossible nowadays to keep secret the composition of drug products. Competitors can usually find out all they want to know through laboratory and other methods of investigation.

"Now let us consider the second alleged reason that the disclosure of formulas would be harmful to the public. . . .

"The man who treats his own ailments has the same need and right as the physician to know what he is using. If the active ingredients are listed on the label, he can treat himself more intelligently, and he can avoid certain drugs to which he knows he is allergic. Are not these considerations vastly more important to his welfare than the alleged psychological advantage of not knowing what is in the drug he is taking? . . .

"The provision branded as 'utterly unreasonable' is simply a means of guaranteeing to the consumer the truth, the whole truth, and nothing but the truth. The public, to whom package medicines are offered, does not have scientific knowledge of the nature and treatment of disease. The patent medicine industry, through its advertising of 'cures' for every known ill, has mis-educated the public in regard to the efficacy of drug products. In no other field of consumer goods has the long-suffering public been so efficiently misinformed. Only a definite provision will serve to offset this situation and give the consumer who wants to treat himself accurate information as to the therapeutic worth of drugs.

"Still another criticism offered by those who oppose the new bill is that all the so-called 'horrible example' medicines and cosmetics have already been put out of existence by the present laws. . . .

"A number of the provisions in the new bill have been the law of the land, as applied to food and drug labels, for twenty-seven years. Section 6, which provides that a food, drug, or cosmetic shall be deemed misbranded 'if its labeling is in any particular false, or by ambiguity or inference creates a misleading impression regarding any food, drug or cosmetic,' has caused considerable disturbance. Except for its inclusion of cosmetics this provision is no broader than the present law. In interpreting the general misbranding provision of the Food and Drugs Act nearly ten years ago, the Supreme Court said: 'The aim of the statute is to prevent that (deception) resulting from indirection and ambiguity, as well as from statements which are false.' This provision, as thus interpreted, has worked no hardship on legitimate drug industries.

"The new bill, while a consumer measure, will also be beneficial to honest manufacturers."

DEATH OF DR. GEORGE G. HUNTER

California Medical Association Loses a Valuable, Beloved Member.—On December 12, death called from his earthly activities Dr. George G. Hunter of Los Angeles. Doctor Hunter had long been prominent in the work of the Los Angeles County Medical Association, had served as its president, and for a number of years had been a member of the Council of the California Medical Association. He had, also, long been associated with the late Dr. Henry G. Brainerd of Los Angeles who, in the year 1922-1923, was president of the California Medical Association. In recent years Doctor Hunter had rendered yeoman service in efforts to bring into being legislation that would make for more humane and scientific care of the mentally sick citizens of California. The circumstances of his taking off are both painful and tragic.

On Saturday, December 9, Doctor Hunter was called to see a woman patient who had been under

his observation and care for several years. Without warning, the patient shot the physician in the back, the bullet coursing through both walls of the stomach and abdomen. It was hoped that the operative procedures might save Doctor Hunter's life, but that was not to be.

Doctor Hunter was beloved by all who knew him. To the profession which he so dearly loved, and in his specialty as a neuropsychiatrist, he gave of the best that was in him. His wise and generous coöperation will be sadly missed in the deliberations of the California Medical Association Council.

"ACUTE UNIT" OF LOS ANGELES COUNTY HOSPITAL FINALLY IN PARTIAL OPERATION

Obstetrical Service Is Installed.—The new twelve-million-dollar "acute unit" of the Los Angeles County General Hospital, which has been a subject of so much discussion for several years past, at last has been partially, even though most modestly occupied. The first group of patients admitted to the new unit at the notable event, which took place on December 12, 1933, are all on the obstetrical service. A photograph of this massive structure, the largest hospital building in the world, is printed on page 70 of this issue.

In due time, if and when this new hospital is put into complete operation, a detailed account of the building will be given. The hospital authorities are making an earnest effort to transfer from the old buildings as many services as possible, and it is hoped that a large part of the new structure will be utilized by the end of January, 1934. In the meantime the following excerpts from one of the Los Angeles newspapers of December 8 may be of interest:

"Out on North State Street is a new modern nineteen-story concrete building. Gardeners are watering the shrubs and trimming the palms and desert cherry trees that beautify the score of acres surrounding the building.

"The building is the new \$12,000,000 General Hospital, patientless as yet.

"Asked a question, a guard at one of the ornate gates said:

"'Oh, they say they're going to move in next week, but they've been saying that for a year and a half.'

"The hospital will be opened next Monday, with two hundred patients of the maternity ward as the first occupants, Superintendent Norman R. Martin, of the hospital, said today.

"In reply to a grand jury query as to why the opening had been delayed, Superintendent Martin declared that transfer of maternity equipment already was under way and that the first patients would be installed next week.

"It will be some time before the building will be fully opened to its normal capacity of 3,500 patients because of the necessary delay in equipping such a vast structure under the specification and bidding system required by law, according to Mr. Martin.

"Connecting the handsome hospital building by a long concrete tunnel, the old hospital building is a strange sight. The first hospital building was put up forty years ago, and additions have been made until the hospital is a series of misshapen buildings, connected by weird runways and spans, the effect being

that of a nightmare, with ill and injured all over the place—in hallways, on porches, and in any nooks large enough for cots.

"Curiously, the new hospital appears to be ready for occupancy by everybody but the patients. There are nurses' lecture rooms with chairs, and the only thing lacking is chalk on the blackboards; elevators with elevator men; a telephone switchboard, with telephone girls at work on calls that are switched into the old hospital; an auditorium for medical talks, and elaborate kitchens with huge soup drums glistening, and all the equipment ready.

"On the other hand, wheel-chairs, obstetric beds, cabinets, and the highly important x-ray, have not yet been installed. . . ."

HUMAN STERILIZATION

California's Experience.—In September, 1933, in its Bedside Medicine department (page 199) CALIFORNIA AND WESTERN MEDICINE printed a symposium on human sterilization. Dr. F. O. Butler, of the Sonoma State Home of California, reported his observations on some 2,264 patients who had been sterilized in that institution. Out of a total of 16,066 human sterilizations performed in the United States, recorded up to January 1, 1933, a total of 8,504 were credited to the State of California. These remarkable figures by California become of more interest in view of the new human sterilization law which will become operative in Germany at the beginning of the new year. The Human Betterment Foundation is authority for the statement that in the United States there are "six million persons who have been, are now, or at some time will be legally committed as insane to State institutions." Again, they state:

"*America's Burden.*—This, then, is the situation which America faces now: 18,000,000 persons who are, or at some time during life will be, burdened by mental disease or mental defect, and in one way or another be a charge and tax upon the rest of the population. It challenges every thoughtful person. . . ."

* * *

Germany's Proposed Sterilization.—As the January issue of CALIFORNIA AND WESTERN MEDICINE is being prepared for press, some dispatches from Europe on proposed human sterilization in Germany, challenge our attention. Because human sterilization is a problem having intimate connection in the fields of heredity, medicine, social ethics, and also political policy and economics, and because in the immediate years to come much consideration will be given to the subject and the principles involved (during which California's experience will be much discussed), it may be proper to append some excerpts from current cablegrams:

STERILIZATION COURTS NAMED FOR GERMANY

"Last-minute preparations were under way in Berlin on December 20 for executing one of the most significant features of Chancellor Hitler's program to make Germany physically fit—the sterilization of persons suffering incurable diseases—according to an Associated Press dispatch.

"On January 1, 1700 'Eugenic Courts' will begin functioning. These will pass judgment on at least 400,000 men and women considered 'hereditary defectives.'

Will Take Two Years

"Depriving these people of reproductive power will take at least two years, it was estimated.

"Instructions have been issued hospital and sanitarium officials, as well as heads of penitentiaries and prisons, to get a list of incurable and habitual criminals ready by January 1.

"The sterilization operations will be performed under court order, after a system of checks from which there will be no appeal.

"Of the 'Eugenic Courts,' one hundred are in Prussia alone, besides twenty-seven 'Supreme Eugenic Courts.'

Diseases Listed

"Nine classes of congenital diseases are specified, the majority of them among the mentally defective, as calling for the operations.

"The sterilization law is applicable, among others, to feeble-mindedness, insanity, blindness, deafness, and serious physical deformities.

"Extreme inebriety has been urged as another affliction to be included.

"The sterilization law was described as the most drastic measure to raise the national efficiency since the days of Ancient Sparta, when weak infants were exposed."

* * *

"Medical experts in Berlin announced on December 20 that 400,000 persons, half of them men and half of them women, would be subjected to sterilization soon under the law for prevention of diseased progeny, according to a United Press dispatch.

"Fifty per cent of those affected were said to be suffering from congenital feeble-mindedness.

"Total expenses of the sterilization were estimated at 14,000,000 marks (\$5,264,000), costing 20 marks for each man and 50 marks for each woman.

"The experts contended the money soon would be repaid, as Professor Lenz estimated the state was spending 350,000,000 marks annually on the care of the mentally afflicted, while Professor Burgdorfer estimated it at close to 1,000,000,000 marks."

* * *

"For the present the fate of at least 400,000 Germans, the *Deutsche Zeitung* says, are involved. These comprising practically the same number of both sexes.

Figures Given

"The law is applicable to hereditary:

"1. Feeble-mindedness, tentatively estimated at 200,000 cases.

"2. Schizomania, 80,000.

"3. Insanity, 20,000.

"4. Epilepsy, 60,000.

"5. Saint Vitus dance, 600.

"6. Blindness, 4,000.

"7. Deaf and dumbness, 18,000.

"8. Serious physical deformity, 20,000.

"9. Chronic alcoholism, 10,000.

"The *Deutsche Zeitung's* eugenics expert said the task could be completed in a period of two years.

"He holds the outlay would represent a saving in the end. Expenditures for the care of the nation's insane alone amount to 700,000,000 marks (about \$261,030,000)." . . .

Having now freed man from much or most of his ancient labors, the next great work for science is to make of this new freeman with "time to think" a being who is happy, not because of the amazing things he owns, but because of the amazing things he can do and think.—John J. Davis, United States Senator from Pennsylvania.

EDITORIAL COMMENT*

THE RÔLE OF HISTAMIN IN ALLERGY

Sir Thomas Lewis,¹ in his researches upon the blood vessels of the human skin, predicated the hypothesis that the urticarial reaction of the skin to injury is due to the release of a histamin-like substance. With scientific caution, he has been chary in identifying this substance as histamin, despite the fact that practically all evidence points to this identity. However, the rôle of this histamin-like substance in the production of a characteristic allergic reaction such as urticaria has stimulated a search for further evidence linking the allergic and anaphylactic reactions to histamin.

Dale,² in his Croonian lectures, mentions the fact that chemical analysis of the lungs of man shows 35 milligrams of histamin per kilo, and the epidermis 24 milligrams per kilo. The significance of this lies in the fact that the lungs and epidermis of man contain the largest proportion of histamin, and are also the most common sites of allergic reactions.

Gebauer and his co-workers³ have obtained a histamin-like substance from vena cava blood after anaphylactic shock. They feel that all evidence points to the identity of this substance with histamin, and probably to its identity with Manwaring's hepatic anaphylotoxin. Using strips of guinea-pig intestine for testing purposes, they found that vena cava blood after anaphylactic shock is active, while systemic and portal blood is not; and also that the substance is not specific and has no latent period in its action on the intestinal strip. They also show that the substance is easily diffusible, basic in character, inactivated by diazotized sulphuric acid, lowers blood pressure on injection in cats, produces characteristic wheals, and does not contract the mouse intestine, all these properties being characteristic of histamin.

Bartosch, Feldberg, and Nagel⁴ have found that the perfusion fluid from the anaphylactic guinea-pig lung also contains a histamin-like substance.

With these facts in mind, one is tempted to theorize on the possible rôle of histamin in clinical allergy: that in asthma there is a release of histamin in the lung, and in urticaria a release of histamin in the skin; that the low blood pressure commonly found in allergic individuals is a

histamin effect. Although this theory affirms the mediation of histamin in the production of symptoms, we have as yet no acceptable explanation as to why histamin is released from the tissues, particularly in allergic individuals.

The field for speculation is wide and will undoubtedly stimulate research in the fundamentals of allergy; but as yet we must wait upon an explanation for the peculiarities of the allergic constitution.

1136 West Sixth Street.

HYMAN MILLER,
Los Angeles.

AMEBIC DYSENTERY

In the midst of so much discussion of amebic dysentery, it may be proper to call attention to one phase of a frequently recommended treatment.

The dosage of emetin hydrochlorid is often too large, when given over a short period of from nine to twelve days. It should be used in smaller dosage and extended over a longer period. Time is a vital element in the peculiar action of the drug. Large dosage will produce injury to the patient, and do but little damage to the amebae. We believe that one-third of a grain intravenously, daily the first week, repeated on alternate days thereafter for five doses, will accomplish as much as the large dosage and practically insure against injury by the drug. The same dosage twice weekly may be continued for months, with no cumulative action. The liver is thus protected and there is less danger of relapse. Meanwhile the treatment with carbarsone should start coincidentally with the emetin and be continued with one capsule each morning and evening, for ten days only. One should be constantly on guard against arsenical saturation, which is usually first manifested by redness or itching of the skin. The arsenical treatment may be repeated in full or in part, after a ten-day interval. One repetition usually suffices to rid the patient of trophozoites and cysts. Watchful search for organisms in the stools during the next year, at intervals of two or three months, is the safest procedure in guarding the patient against damage from the organism and from the drug.

Much has been said about the cumulative action of emetin and its damage to the heart muscle. There will be no heart symptoms or muscle tiredness, and none but good after-effects, if the above method is followed. The first complaint of muscle tiredness demands the lengthening of the intervals in the administration of the drug. This symptom shows saturation. The drug should not be given beyond its physiologic activity. The same is true of arsenic. This treatment, when so carried on, will save the profession much criticism and give the patient results equal to quinin in malaria. We have clinically checked the hearts of many emetin-treated patients and have been unable to find a single damaged heart, although many of these patients came complaining of heart symptoms at the beginning. Dr. Robert Langley has checked the electrocardiography of these hearts and has found every one normal.

* This department of CALIFORNIA AND WESTERN MEDICINE presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to all members of the California and Nevada Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

¹ Lewis, Thomas: *Blood Vessels of the Human Skin*. Shaw & Sons, Ltd., London, 1927.

² Dale, H. H.: *Croonian Lectures on Some Chemical Factors in the Control of the Circulation*, *Lancet*, 216:1179, Vol. 1 (June 8), 1929.

³ Gebauer, E., Fuenegg, E., and Dragstadt, C. A.: *The Nature of Physiologically Active Substance Appearing During Anaphylactic Shock*, *Am. J. Physiol.*, 102:520-526 (Nov.), 1932.

⁴ Bartosch, R., Feldberg, W., and Nagel, E.: *Weitere Versuche über das Freiwerden eines histaminähnlichen Stoffes aus der durchströmten Lunge sensibilisierter Meerschweinchen beim Auslösen einer anaphylaktischen Lungensterne*, *Pflügers Archiv für die gesamte Physiologie des Menschen und der Tiere*. 231. Band. 4. und 5. Heft. 1933.

We cannot refrain from expressing considerable doubt as to the epidemic possibilities of the amebic infection. It is an endemic disease and is biologically so. For many years we who have studied the subject know it has existed in every state in the Union in sufficient numbers to recommend, in every thorough examination, careful search for its presence. Bacillary dysentery is more common in this country than is generally conceded. Logically, a great many of the bacillary cases will also be ameba-infested. Bacillary dysentery can easily be epidemic, and there are many symptoms to suggest its presence in the cases recently reported. I feel sure there need be no fear of an epidemic of amebiasis in our country.

1930 Wilshire Boulevard.

JOHN V. BARROW,
Los Angeles.

CORNS AND DEFORMITIES OF THE FIFTH TOE

The little toe is very frequently a grave offender to the civilized individual, causing pain, discomfort, and unsightliness. The toe is oftentimes claw- or hammer-shaped, and is therefore a predisposing factor to severe pain due to corns and inflammations of the bursa and periosteum. The exciting agent is the shoe, with its pressure upon the deformed toe. But we cannot always blame the footwear; even a wide enough shoe will cause pressure disturbance when the little toe is deformed or overlapping its neighbor.

This deformity is especially common in statically malformed feet such as flat- or high-arched feet. But it must be remembered that much disfigurement of the fifth toe is due to degenerative changes in men. Not less than half of the cases present a synostosis, *i. e.*, an abnormal osseous union of the terminal and second phalanges, so that the toe contains not two but only one phalangeal joint. Such rudimentary development we find particularly in the middle phalanx, which even if not united with the last phalanx is short and square, its width at times being greater than its length. Unfortunately, the synostosis develops with the toe in a flexed position; the apex of the angle pointing upward and causing pressure trouble. The flexor brevis minimus digitus muscle is also undergoing retrogressive changes: in most instances it exerts no action upon the toe at all; in others contraction is so weak that it has hardly any toe effect. The rudimentary development and action of the muscles can be noticed especially in cases where the above synostosis has developed.

The little toe is not the only one in which retrogressive or degenerative changes are noticeable. The neighboring, fourth and third, toes frequently show traces of retarded development. This is seen mainly in the middle, but at times also in the terminal phalanges. The second toe only is, generally, free from these changes. From this explanation it is obvious that the malformations of the little toe, with their discomfort and pain, are not entirely due to the ill-fitting shoe, but result from the deformed development.

It is fallacious to advise an amputation of any toe, including the last one; although the loss of the little toe may not give rise to any trouble, it should be avoided, if only for the reason that the foot adopts a crippling appearance. The cure of such deformed toes can be had by operative procedure, which consists in ankylosing the phalanges in a straight position after a wedge-shaped resection of bone from each of them.

In cases where the toe is deviated outward, over- or underlapping its neighbor, the contracted joint capsule on the mesial surface must be severed or stretched, and the elongated part of the capsule on the lateral surface must be shortened after the toe has been straightened. In addition to the plication of the capsule, also the adductor minimus digitus must be shortened in order to hold the toe permanently in a straighter line.

727 West Seventh Street.

A. GOTTLIEB,
Los Angeles.

*Operation and Conduct of Tuberculosis Clinics.**—A community which manifests a real interest in tuberculosis clinics is producing constantly a higher ratio of tax producers. Lack of such interest, on the contrary, increases the ratio of tax consumers.

No community endeavor produces more far-reaching benefits in the early discovery of tuberculosis than the tuberculosis clinic. Properly equipped and satisfactorily administered, such a clinic should be a diagnostic school for practicing physicians, a public health school for the community, a scientific clearing house for suspected and doubtful cases and a haven of hope and service for victims of the disease who are not appropriate cases for sanatorium treatment or who are not in a position to employ a family doctor. An atmosphere of private consultation is an essential feature of every clinic.

A tuberculosis clinic should be supported by public funds. Where necessary, supplemental funds may be granted by private agencies in order to provide adequate personnel and equipment.

Unquestionably, the pioneer work performed by unofficial agencies in demonstrating the value of such clinics has been a potent factor in making this service almost universally available. These agencies have used, and should continue to use, every effort to induce public officials to take over this function. As in all government activity, the human side when correlated with the scientific, makes a firm and lasting platform of action. Lack of either of these elements necessarily results in an unbalanced program, lack of popular support and mediocre service.

No aspect of public health, with its varied sociological problems, demands more understanding and humane administration than that concerned with tuberculosis. A clinic program which is not designed to compensate for the varied social maladjustments of tuberculous cases and families is un-American in its philosophy and cannot be expected to achieve other than questionable results.

Public health, medical practice and social welfare are inextricably interwoven in the fundamental purposes of a tuberculosis clinic. In each of these fields, both the patient and society should be beneficiaries of the service. Although the patient may receive the most direct benefits, his family, associates, and the community constantly reap advantages in direct proportion to the thoroughness of the clinic work.

* Abstract of paper by Robert E. Plunkett, M.D., director, Division of Tuberculosis, State Department of Health. Presented at the annual meeting of the New Jersey Tuberculosis League, Trenton, October 19, 1933.

STATE MEDICAL ASSOCIATIONS

This department contains official notices, reports of county society proceedings and other information having to do with the state associations and their component county societies. The copy for the department is edited by the state association secretaries, to whom communications for this department should be sent. Rosters of state association officers and committees and of component county societies and affiliated organizations, are printed in the directories noted under Miscellaneous, on the front cover index.

CALIFORNIA MEDICAL ASSOCIATION

GEORGE G. REINLE President
CLARENCE G. TOLAND President-Elect
EMMA W. POPE Secretary-Treasurer

OFFICIAL NOTICES

Railroad Transportation to Riverside—Annual Session (April 30 to May 3, 1934).—Buy through ticket to Riverside on *Sunset Limited*, Sunday, April 29. If twenty-five or more passengers on the Sunday night *Limited* hold Riverside tickets, special electric trains to Riverside will connect at the Southern Pacific depot in Los Angeles, to take passengers direct to Riverside. The *Sunset Limited* leaves San Francisco at 6:45 p. m. and reaches Los Angeles at 8:15 a. m.

The Lark and Padre arrive too late to permit attendance at the opening of the Monday general session.

Buy your ticket direct to Riverside, via Los Angeles, on *Sunset Limited*. Round trip, \$21.10.

Hotel Rates for Annual Session April 30 to May 3, 1934

MISSION INN, CONVENTION HEADQUARTERS

American Plan

Single rooms without bath, \$6 per day.
Single room with bath, \$8 per day.
Double room without bath, \$11 per day.
Double room with bath, \$13 per day.

Other Riverside Hotels

European Plan

Reynolds Hotel—One Hundred Rooms

Single rooms without bath, \$1.50.
Single rooms with bath, \$2.50.
Double rooms without bath, \$2.50.
Double rooms with bath, \$3.50.

Tetley Hotel—One Hundred Rooms

Single rooms without bath, \$1 and \$1.50.
Single rooms with bath, \$1.50 and \$2.
Double rooms without bath, \$1.50 and \$2.
Double rooms with bath, \$2 and \$3.

Plaza Hotel*—Forty-Two Rooms

Single rooms without bath, \$1.
Single rooms with bath, \$2 and \$2.50.
Double rooms without bath, \$1.50.
Double rooms with bath, \$3.

Potter Hotel—Twenty-Six Rooms

Single rooms with bath, \$2 and \$2.50.
Double rooms with bath, \$3 (garage included).

Warrington Hotel—Twenty-Eight Rooms

Single rooms without bath, \$1.
Single rooms with bath, \$1.50.
Double rooms with bath, \$2.50.

Aureau Vista Hotel—Twenty Rooms

Single rooms with bath, \$1.50 and \$2.50.
Double rooms with bath (twin beds), \$2 and \$3.50.

Victoria Hotel—Twenty Rooms

Single rooms without bath, \$1.
Single rooms with bath, \$2.
Double rooms without bath, \$2.
Double rooms with bath, \$2 and \$3.50.

* Connecting rooms with bath, deduct 50 cents from rate of two rooms. Suites available for parties of three and four.

Council Meeting.—The next meeting of the Council will be held in the offices of the Association, room 2004, 450 Sutter Street, San Francisco, on Saturday, January 20, 1934. * * *

Application for Place on Annual Program.—Members who desire to present papers before the 1934 annual session, which will be held at Riverside, should write to the secretary of the section before which the particular subject should be presented.

Names and addresses of section officers are regularly published on advertising page 4 of each issue of *CALIFORNIA AND WESTERN MEDICINE*.

When requesting place on the program, a brief résumé of the paper should accompany the application. * * *

Committee on Scientific Exhibits.—To stimulate greater interest in the scientific exhibit at the annual session, a special committee has been appointed by the Council: William J. Kerr, M. D., Lyell C. Kinney, M. D., Frederick Leet Reichert, M. D., Ernest M. Hall, M. D., and Elbridge Best, M. D., chairman. * * *

Scientific Exhibits.—Those who are interested in planning a scientific exhibit at the Riverside meeting should apply for space to the Committee on Scientific Exhibits through the State Association office, room 2004, 450 Sutter Street, San Francisco, before the first of March, 1934.

In making application give title and description of exhibit with an estimated amount of floor and/or wall space required.

COMPONENT COUNTY MEDICAL SOCIETIES

FRESNO COUNTY

The annual meeting of the Fresno County Medical Society was held December 5 at 8 p. m. in the University Sequoia Club, Dr. E. J. Schmidt presiding. Dr. Neil J. Dau acted as secretary.

The application of Dr. Lloyd James was read before the society. Dr. V. Millasich was elected to membership.

Dr. A. E. Anderson gave a brief résumé of the activities of the Hospital Insurance Committee, and stated that the Fresno County Medical Society was now ready to proceed with incorporation.

Doctor Anderson moved that the directors of the county medical society and the groups of men to be elected as directors of the corporation be empowered and authorized to proceed with the steps necessary to offer this service to the public as soon as possible. Doctor Scarboro seconded the motion, and it was passed favorably.

Doctor Dau moved that the county medical society employ Mr. Gilbert Jertberg (recommended by Mr. Hartley Peart). This motion was seconded by Doctor Randel and passed favorably.

Under new business the following were elected directors of the Hospital Insurance Plan: Doctors A. E. Anderson, J. R. Walker, and G. H. Sciaroni (three years); Doctors C. Collins, T. Sample, and E. Couey (two years); Doctors J. Morgan, Guy Manson, and W. Wiese (one year).

Under election of officers for the new year the following were elected: President, Neil J. Dau; first vice-president, W. F. Wiese; second vice-president, Kenneth Stanford; secretary, Henry Randel; librarian,

G. A. Hare. Board of Directors—E. J. Schmidt. Delegates—G. W. Walker, G. H. Sciaroni, and T. F. Madden. Alternates—E. R. Scarboro, Kenneth Staniford, R. W. Dahlgren.

NEIL J. DAU, *Secretary*.

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MENDOCINO COUNTY

The regular meeting of the Mendocino County Medical Society was held in Talmage at 7 p. m., December 6.

Before the regular program, Dr. and Mrs. R. A. Cushman entertained at dinner the combined County Medical Society and Woman's Auxiliary.

The following were present: Doctors Babcock, Bennett, Bowman, Clark, Cleland, Cushman, Hill, Hummel, Kirwin, LeBaron, Pinto, Rea, Rogers, Starbuck, Strong, Toller, and Wrinkle. Mesdames Bennett, Bowman, Cushman, Gleason, Hill, Kirwin, LeBaron, Pinto, Rankin, Rea, Rogers, and Toller.

Doctor Cushman discussed early medical conditions in California.

The following committees were appointed:

Physical Therapy—Doctors Van Allen and Wolfe. Education—Doctors Cleland and Hummel.

Cancer—Doctors Kirwin and Toller.

Medical Advisory to County Relief Committee—Doctors Babcock, Bowman, Cleland, Hill, Pinto, Rea, Scudder, and Strong.

Dr. Henry Rogers of Petaluma very thoroughly explained the activities of the State Association, especially as to the distribution of the yearly budget.

On motion of Doctors Cushman and Babcock, Doctor Bowman was nominated and elected by acclamation as president of the society for 1934.

On motion of Doctors Cushman and Kirwin, Doctor Toller was nominated and elected by acclamation as secretary-treasurer of the society for 1934.

Doctor Cushman continues as delegate to the state convention.

A combined social meeting of the Woman's Auxiliary and the County Medical Society was the climax of a most pleasant evening.

PAUL J. BOWMAN, *Secretary*.

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ORANGE COUNTY

The December meeting of the Orange County Medical Society was held in the Chapel of the Orange County Hospital at 8 p. m.

Dr. Mabel Geddes was elected to membership in the local society on transfer from Humboldt County.

Following the usual brief business session, mimeographed copies of correspondence from the State Association, in regard to the federal emergency relief fee schedule to be paid private physicians for work done on indigents referred through the Welfare Department, were given to each individual. The matter was referred to the Public Relations Committee.

Two representatives from a health insurance group operating in Los Angeles and planning to establish a branch in Orange County were heard. The matter was referred to the Public Relations Committee and the Committee on Medical Economics for joint investigation.

The annual election of officers was then held, with the following result. In each case, there being only one nominee, the secretary was instructed to cast a unanimous vote: President, Dr. H. Huffman; vice-president, Dr. R. E. Hawes; secretary-treasurer, Dr. W. S. Wehrly; librarian, Dr. C. D. Ball; counselor, Dr. F. H. Gobar, to succeed himself and to serve for 1934-1936. Delegate for 1934-1935, Dr. D. R. Ball, to succeed himself. Alternate, Dr. G. W. Olson.

Doctor Roblee, district counselor, then spoke on *What Do You Get for Your Money?* This was followed by Mr. Otto Jacobs, on *Treatment of Cases from the Legal Aspect*. Doctor Chase then gave an interesting paper on *Radiologist in Court—Anomalies and Errors in X-Ray Interpretation*.

WALDO S. WEHRLY, *Secretary-Treasurer*.

SACRAMENTO COUNTY

The regular meeting of the Sacramento Society for Medical Improvement was held at the Elks Temple on Tuesday evening, October 17, 1933. The president Dr. George Briggs, called the meeting to order at 8:30 p. m. Sixty-six members were present.

Mr. Faulkner, in a short speech, made an appeal for the Sacramento Community Chest.

Doctor Wilder reported a case of foreign body—a piece of glass tubing—in the male urethra.

The papers for the evening were devoted to the subject of cystoscopic prostatectomy.

Dr. E. W. Beach opened the symposium with a historical account of *The Treatment of Obstruction to the Flow of Urine*. The three types of prostatectomy—suprapubic, perineal, and transurethral resection—were discussed and the indications for each type of operation mentioned. Doctor Beach stressed the point that there was a definite operation for every type of prostatic pathology. The paper was well illustrated by lantern slides and a moving-picture film.

Dr. Frank Ohanneson continued the symposium with a paper on the *Causes of Mortality and Complications Following Transurethral Prostatic Resection*.

Dr. E. M. Wilder stressed the importance of surgical removal of the prostate for certain types of hyperprostatism.

Dr. Nathan G. Hale closed the symposium with a paper entitled *Transurethral Resection for Relief of Prostatism*. Doctor Hale stressed the point that the type of prostatic operation to use on a given patient depended entirely on the prostatic pathology present in that patient.

The transfer of Doctor Harada from the San Francisco County Medical Society to the Sacramento Society was unanimously ratified. The applications of Doctors O'Brien, Boscoe, and Anderson were unanimously accepted.

The application of Dr. A. A. Atkinson was read for the first time.

FRANK W. LEE, *Secretary*.

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SAN BERNARDINO COUNTY

The San Bernardino County Medical Society held its regular meeting at the County Charity Hospital in San Bernardino on Tuesday, December 5, 1933.

A letter from the secretary of the Riverside County Medical Society, regarding a special meeting to be held on December 20, was read.

A letter from Doctor Dickie, regarding commercial hospital associations, was read, and as a result of this letter it was decided to postpone the vote on the proposed change in the by-laws until the Committee on Public Relations could make a further report.

Dr. E. J. Eyttinge, as a member of the Medical Advisory Board of the County Hospital, briefly discussed certain phases of its management.

The application of Doctor Drummond of Randsburg was voted on and accepted. The reinstatement of Doctors Kell and Reed was voted on and accepted.

The scientific paper of the evening, *Endocrine Types*, illustrated with lantern slides, was presented by Dr. C. A. Wright of Los Angeles.

The meeting adjourned at 10:15 p. m., after which refreshments were served.

E. J. EYTINGE, *Secretary*.

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SANTA CRUZ COUNTY

The October meeting of the Santa Cruz County Society was held in Santa Cruz on October 10, 1933. The speaker of the evening, Dr. Harry Alderson, presented an illustrated review and demonstration of dermatologic conditions of interest to the man engaged in general practice. A general discussion followed the pictures and proved very instructive.

The application of Dr. Reginald Rood of Davenport for membership was read and referred to the board of censors.

The November meeting of the society was held in Watsonville on November 14. The application of

Doctor Reginald Rood was approved and he was welcomed as a new member of the society.

Doctor Merrill Mensor of San Francisco was the speaker of the evening. His subject concerned industrial injuries, especially those of an orthopedic nature, and contained much valuable information. Lantern slides were used to supplement much of the data, and several new types of splints were demonstrated.

Among those absent at the November meeting was Dr. Ehler Eiskamp of Watsonville, who recently had sustained a fracture of the ankle. Recent favorable reports concerning his convalescence, however, indicate that he will soon be back with us.

SAMUEL B. RANDALL, *Secretary*.

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SHASTA COUNTY

The Shasta County Medical Society held its regular meeting at Dozier's Hospital on December 6, 1933. A discussion regarding the admittance of part-pay patients in county hospitals was held and it was unanimously voted by all the members that the society did not approve of the commercializing of county hospitals and the admittance of pay patients, but that county hospitals should only be used for indigent and poor people.

Dr. Guy Leslie Kay was elected a member of the society. Dr. M. D. Pratt was elected president, Dr. F. Stabel, vice-president, and Dr. F. H. Olberg, secretary-treasurer for the next year.

F. H. OLBERG, *Secretary*.

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SOLANO COUNTY

The Solano County Medical Society held the last meeting of the year, 1933, at the Hotel Casa de Vallejo on Tuesday evening, December 5.

Dr. John W. Green was elected president; Dr. Cary A. Snoddy, vice-president; and Dr. A. J. Ryan, secretary-treasurer, for the year 1934. Delegates to the California Medical Association convention at Riverside were also elected. Dr. P. B. Fry of Benicia is delegate, and Dr. C. A. Snoddy of Vallejo is alternate.

It was noted at this meeting that 88 per cent of the active, practicing physicians in Solano County were members of the county medical society. Dr. Henry Rogers, councilor of the California Medical Association, spoke at length on various matters pertaining to the California Medical Association, its aims, and the facts which are new and interesting concerning unemployment relief.

Doctor Rogers' remarks were followed by a presentation of the subject, *Hypertrophied Prostates*. Dr. Henry Kreutzman of San Francisco was the guest speaker, and after going into the symptoms, pathology, and surgical methods which have been in use for years, he presented a practically new method of surgical attack by a cauterizing loop, used through the urethra. This method was demonstrated by a motion picture which showed all the details of the performance of this new operation. The meeting was well attended and enjoyed by all present.

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The October meeting was also well attended and much enjoyed, the guest speaker being Dr. LeRoy Brooks of San Francisco, who spoke on *Postoperative Care*.

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The November meeting was addressed by Dr. Max Rothschild of San Francisco, on the subject of *Pulmonary Tuberculosis*, with indications for compression of the lung, and a discussion of artificial means of compression, and a new surgical method of treatment called phrenectomy. Doctor Rothschild presented some interesting x-ray pictures of the lung, both before and after phrenectomy. A surgical explanation of phrenectomy was presented by Dr. G. D. Delprat. Discussion was general, many questions being asked, some of which were answered by Dr. H. C. Warren of San Francisco.

JOHN W. GREEN, *Secretary*.

SONOMA COUNTY

The Sonoma County Medical Society held its annual meeting at Sonoma Mission Inn on December 9, 1933, at 7 p. m. with a large attendance of members and their ladies.

During the turkey dinner a soloist rendered pleasing songs, and after the dinner Dr. F. E. Sohler told us of some of his experiences and impressions while in Russia this last summer. His remarks were most interesting and were appreciated by all present.

A business meeting was then held, officers' reports received and ordered filed, and communications were read and debated.

The following members were elected to office for the year 1934: President, Dr. E. J. Finnerty of Sonoma; vice-president, Dr. F. O. Butler of Eldridge; secretary, Dr. W. C. Shipley of Santa Rosa; treasurer, Dr. A. A. Thurlow of Santa Rosa.

Dr. S. Z. Peoples of Petaluma was reelected a member of the board of censors to serve until December 31, 1936.

Other minor business was transacted and the meeting adjourned to the main dining room, where dancing was enjoyed.

W. C. SHIPLEY, *Secretary*.

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STANISLAUS COUNTY

The November meeting of the Stanislaus County Medical Society was held on the 10th at Grollman's, 820 Twelfth Street. The meeting was called to order by the president, Dr. Donald Robertson. Eighteen members were present.

A bill for projector, screen, and case, amounting to \$139.95, was ordered paid.

It was voted by the society to present Mrs. R. E. Maxwell a box of candy, for making a case for the picture projector.

Dr. John H. Woolsey of the Woodland Clinic gave a very interesting talk on *Lesions of the Colon*.

Dr. Earl H. Gray of Woodland gave a talk on *Radiologic Studies of Fractures*.

The following officers for 1934 were elected: President, Dr. J. A. Porter; vice-president, Dr. Hans Hartman; secretary-treasurer, Dr. Richard Husband; censor (for three years), Dr. E. G. Allen; delegate, Dr. R. S. Hiatt.

J. A. PORTER, *Secretary*.

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TULARE COUNTY

The regular November meeting of the Tulare County Medical Society was held on the 19th at 2 p. m. at Motley's Café in Visalia. A buffet luncheon was served.

All regular business procedures were dispensed with and the entire meeting given over to the scientific program for the afternoon. Dr. Albert G. Bower of Glendale prepared a clinic on communicable diseases. He was assisted by Doctors Tobias and Vener. These men discussed epidemic and cerebrospinal meningitis; nutritional factors in the care of communicable diseases; tetanus; nonspecific laryngeal tracheitis; pertussis; and measles. Therapeutics and practical aspects were particularly stressed. A round table of general discussion followed and a decidedly valuable meeting was adjourned at 5:30 o'clock.

Those in attendance were Doctors Preston, Kohn, Beck, A. Bond, N. Miller, E. Bond, Fels, Parkinson, Fowler, McClure, Fuller, Barber, Guido, Brigham, Weiss, Betts, Thortilott, and Hicks.

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The stated meeting of the Tulare County Medical Society was held at 5:30 p. m. Sunday, December 10, 1933. A dinner preceded the program.

Various communications were read. A discussion of local dues for the ensuing year was voiced and suggestions offered for a 50 per cent reduction. Doctor Fillmore reported on the investigations of the Education Committee.

Election of officers for 1934 resulted in the following unanimous ballot: President, Dr. Donald Fowler

of Exeter; vice-president, Dr. Hicks of Tulare; secretary-treasurer, Dr. Karl F. Weiss of Visalia. Censors, Dr. E. R. Zumwalt of Tulare (one year), Dr. R. C. Hill of Exeter (two years); Dr. W. W. Tourtilott of Porterville (three years). Delegate, Dr. Frank Kohn of Tulare. Alternate, Dr. Donald Fowler of Exeter.

These officers will assume their new duties at the first 1934 meeting.

The guest speaker of the evening, Dr. Frederic C. Bost, orthopedic surgeon of San Francisco, was introduced and spoke on *Some Practical Considerations in Fracture Dislocations of the Ankle*. Mr. Gus Kern assisted Doctor Bost in the demonstration. Illustrative charts depicting the various types of fractures, based on Ashhurst's classification, were displayed and typical types further clarified by x-ray films of actual cases before and after proper reduction. Principles of treatment were definitely and clearly given. The more recent nonpadded plaster cast application technique, according to Boehler's method, was demonstrated on an ankle model. Doctor Bost's talk was much appreciated.

KARL F. WEISS, *Secretary-Treasurer*.

CHANGES IN MEMBERSHIP

New Members (3)

Los Angeles County.—Calvin Albert Lauer.

San Diego County.—Albert Jumblatt.

San Francisco County.—Charles Fay Steiss.

Transferred (1)

Mabel Geddes, from Humboldt to Orange County.

In Memoriam

Frankenheimer, Jule B. Died at San Francisco, December 14, 1933, age 60. Graduate of Cooper Medical College, 1898, and licensed in California the same year. Doctor Frankenheimer was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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Hunter, George Graham. Died at Los Angeles, December 13, 1933, age 57. Graduate of the University of California Medical School, San Francisco, 1906, and licensed in California the same year. Doctor Hunter was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

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McKinnon, George Washington. Died at Arcata, November 21, 1933, age 67. Graduate of McGill University Faculty of Medicine, Montreal, 1888. Licensed in California in 1889. Doctor McKinnon was a member of the Humboldt County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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Wightman, William Dewey. Died at Los Angeles, December 6, 1933, age 35. Graduate of Northwestern University Medical School, Chicago, 1926, and licensed in California the same year. Doctor Wightman was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

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Wills, William Le Moyne. Died at San Marino, December 4, 1933, age 80. Graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1882. Licensed in California in 1883. Doctor Wills was an honorary member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

OBITUARIES



George Graham Hunter
1876-1933

By the tragic death of Dr. George Graham Hunter on December 12, 1933, the Los Angeles County Medical Association and the California Medical Association lost a most outstanding and devoted member. In the councils of both organizations, Doctor Hunter's broad vision and sound judgment were most valuable and highly respected.

Scientific medicine, especially in neurology and psychiatry, likewise sustained a great loss. And the community and state will miss this most useful medical practitioner and civic worker.

Doctor Hunter was born in Illinois. At the age of twelve the family came to California. He attended the University of Southern California one year, but finished his college course at the University of California at Berkeley in 1903. He received the degree of Doctor of Medicine in 1906 from the same institution. In 1907 he came to Los Angeles to become associated with Dr. H. G. Brainerd and in due season became his partner.

Doctor Hunter held many positions of honor and trust in the medical organizations of the city, county, and state. He was past president of the Los Angeles County Medical Association, secretary-treasurer and past president of the Clinical and Pathological Society, past president of the Society of Psychiatry and Neurology, member of the Board of Councilors of the California Medical Association, Fellow of the American College of Physicians, member of the Psychopathic Association of California, member of the insanity Commission of the state. He was a member of the staff of the Los Angeles General Hospital for twenty years, and served on the staff of St. Vincent's, Cedars of Lebanon, California and Santa Fe hospitals, as well as several private hospitals. He served for nine months as captain of the Medical Corps with Base Hospital No. 35 in France during the World War. In addition to all of this he found time for special study in the neurologic centers of Philadelphia, Boston, and Baltimore.

Your committee feels that the splendid and most worthy tribute paid to his memory by Dr. Carl S. Patten, pastor of the First Congregational Church in Los Angeles, at his funeral service so fittingly expresses the sentiments of the entire medical profession that they quote briefly from this address as follows:

"Words and names and outward professions mean little or nothing here. The question of the ancient prophet goes to the root of the matter: 'What doth the Lord require of thee but to do justly, to love mercy, and to walk humbly with thy God.' So Doctor Hunter did, and so he walked; seeking not his own

but the good of those who trusted so much to him, and in the steps and after the pattern of the Great Physician. I have not known a better Christian man.

"His attachments were deep and permanent. He gave his friendship without stint, and his love without recall. And what he thus gave was returned to him in fullest measure. He carried his family and his friends always in his heart. And what he was to those outside, that and vastly more he was to his own. One of his friends said of him: 'He wove himself into your life, so that having once known him you could not get along without him.' There is a motto that hung, and still hangs, in his house: 'If lives were measured by the joy we give, not by the years we chance to live, you, whose fine spirit helps and lifts and cheers so many of us, would live a thousand years.' And so he does live, and so he will live, among us, as long as we live."

WILLIAM DUFFIELD
EDWARD M. PALLETTE
CLARENCE G. TOLAND.

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William Le Moyne Wills 1853-1933

Dr. William Le Moyne Wills died at his home, 2355 Monterey Road, San Marino, December 3, 1933, at the age of eighty years.

Doctor Wills, one of the prominent men in Los Angeles in 1887, received his literary education at Harvard and his medical education at the medical department of the University of Pennsylvania at Philadelphia, graduating there in 1882. His father was a retired lawyer, having a beautiful home on "Fort Hill," with magnificent grounds and gardens overlooking the Plaza—the old Mexican part of the city—the whole of what is now Lincoln Heights (then East Los Angeles) and the business district.

Doctor Wills was president of the Southern California Medical Society in 1890, president of the California Medical Association in 1896, and president of the Los Angeles County Medical Association in 1899.

He was one of the original members of the pioneer faculty of the medical department of the University of Southern California and held the chair of descriptive and surgical anatomy (taught anatomy eighteen years) until 1903 and then clinical surgery for the succeeding six years.

Doctor Wills was on the Board of Education from 1893 to 1897, and helped to lay the foundation for the nonpartisan Board of Education. He was also a member of the State Board of Health from 1903 until 1920, continuing on this board during these seventeen years at the request of leading members of the medical profession of Southern California. He received his first appointment by Governor George C. Pardee, and at the end of his regime Governor Pardee appointed Doctor Wills a member of the Sixth District Agricultural Board, which, by successful litigation, saved the Agricultural Park (now Exposition Park) for the State of California.

Doctor Wills's father and mother were instrumental in founding the Cremation Society of Southern California, and built the first crematory on the Pacific Coast at Rosedale Cemetery, in Los Angeles.

Doctor Wills had always taken an active interest in local politics with the aim of bettering local conditions. He was a great lover of horses and was one of the founders of the Amateur Driving Club, Los Angeles, which gave much pleasure to lovers of sport. He was one of the last doctors to give up the use of horses in his business.

Doctor Wills and his sister, Miss Wills, were prominent in founding the Children's Hospital in 1901. The General Bouton Home on Castelar Street, corner of Alpine, was purchased and used as the first building of the present Children's Hospital. For the first three years Doctor Wills was its chief surgeon.

C. M. A. DEPARTMENT OF PUBLIC RELATIONS*

State Medicine†

The term "state medicine" occurs with increasing frequency in medical literature and in conversations between medical men. It is used many times as if it conveyed one definite meaning.

A little conversation with doctors will soon bring out the fact that there is a variety of opinions as to what state medicine really is. As a result of this lack of uniformity of opinion some confusion has grown up concerning the whole idea.

One doctor I know has been accused of being willing to sponsor or support a movement alleged to be in the direction of state medicine, when the facts are the movement was inaugurated for the purpose of combating state medicine.

Some of this confusion of opinion is doing harm and should be cleared away. The term is not easy to define. There are many practices which one doctor may regard as state medicine and another not as state medicine. For example, organized medicine has sponsored the creation of state, county, and municipal departments of health for the purpose of carrying on certain medical activities in the interest of public health. These activities and practices constitute state medicine in a sense but they are not state medicine in another sense when their activities are kept within the proper bounds.

Organized medicine has sponsored the creation of municipal hospitals in which indigent patients receive free medical and hospital care. The plan, or system, under which these institutions operate varies. In some instances doctors who take care of patients receive remuneration. In others, the intern staff receives some remuneration, and the attending staff from the outside receives no pay whatever. When properly run such institutions are not engaged in state medicine, though they are financed by the government.

Medical organizations have sponsored the creation of tuberculosis hospitals which care for and treat tuberculosis patients free of charge, or at small cost. In most of these institutions the doctors in attendance are resident in the institution and devote their entire time to the care of such patients and draw a salary from the state, county, or municipality, as the case may be.

One might continue the enumeration of examples of medical activities on the part of the government which no one regards as state medicine, but the above will suffice to show that everyone recognizes that there are certain activities which are medical in nature which must be performed by the state or some unit of it. For the state or some unit of it to engage in a medical activity does not of itself constitute state medicine.

We propose the following as a definition: State medicine is a system of medical practice in which the physician renders services as an employee of the state and in which the patient has no voice in the selection of his physician and which practice places the physician so engaged in unfair competition with practitioners.

There are several elements in state medicine. In the first place an essential relationship between doctor and patient is destroyed. That is to say, the patient gives up his liberty of choosing his doctor and the doctor has no liberty in choosing his patient. The destruction of this relationship is of vital importance not only for the moment but for all times to come. It is the most destructive phase of the whole subject.

* An open forum for progress notes on the department's activities, and for brief discussions on medical economics. Correspondence and suggestions invited. Address Walter M. Dickie, Room 2039, Four Fifty Sutter Street, San Francisco. This column is conducted by the Director of the Department.

† Reprinted from the *Journal Tennessee Medical Association* (Aug.), 1933.

In the second place, an unethical practice is engaged in. It is unethical for the simple reason that it is unfair. Ethics is fairness. It is around this sense of fairness and sound good policy that the whole code of ethics is constructed.

From the examples cited it is obvious that it is possible for the state to render aid to sick people under such conditions and circumstances as not to constitute an unfair practice. For example, when a health department engages in activities which were never intended, it places the physicians of that department in direct and unfair competition with private physicians and they therefore become engaged in unethical and unfair practice. If a municipal hospital should inaugurate the practice of admitting and caring for patients who are not indigent then that institution would be engaging in unethical and unfair practice.

All these elements must be taken into consideration in determining whether or not a certain practice constitutes state medicine in the vicious form which organized medicine seeks to combat. There are two elements ordinarily which stand out. One is the destruction of freedom of both doctor and the patient, and the other element is the element of gross unfairness. As in the case of contract practice, elements which enter into the practice constitute the menacing feature. It is perfectly possible for a unit of the government to render medical service without violating ethical principles. When these institutions, however, engage in practices which are in violation of fundamental ethical principles then they become destructive to the best that is in people, in government, and the medical profession.

Medical activities on the part of the state become vicious and menacing state medicine when fundamental ethical principles are violated.

THE WOMAN'S AUXILIARY TO THE CALIFORNIA MEDICAL ASSOCIATION*

Component County Auxiliaries

Alameda County.—The regular November meeting of the Woman's Auxiliary to the Alameda County Medical Association was held on Friday, November 17, 1933, at the Women's Athletic Club, Mrs. Charles A. Dukes, president, presiding.

The hostesses for the day were Mesdames Benjamin Black, George McClure, Nelson Keeler, and Albert Rowe.

Committee reports were heard from Mesdames William Sargent, Benjamin Black, Lloyd Kindall, Frank Baxter, Harold Trimbull, Leonard Barnard, and Clarence DePuy.

New members announced were Mrs. G. W. Robinson, Mrs. Roesner Graham, and Mrs. Emery Ranker.

Officers and directors for 1934 were installed by the outgoing president, Mrs. Charles A. Dukes.

New officers are as follows: President, Mrs. William H. Sargent of Oakland; president-elect, Mrs. R. T. Sutherland of Oakland; first vice-president, Mrs. R. H. Smithies of Alameda; treasurer, Mrs. Carl Bowen of Oakland; recording secretary, Mrs. Harold Carpenter of Berkeley; corresponding secretary, Mrs. Ed Patterson of Oakland.

Directors: Mesdames Louis Dyke of Oakland, Harry Bell of Piedmont, A. W. Henry of San Leandro, Nelson Keeler of Piedmont, O. B. Jensen of Livermore, and Walter Dickie of Berkeley.

* As county auxiliaries to the Woman's Auxiliary to the California Medical Association are formed, the names of their officers should be forwarded to Mrs. Thomas J. Clark, chairman of the Publicity and Publications Committee, 40 Ross Circle, Oakland. Brief reports of county auxiliary meetings will be welcomed by Mrs. Clark and must be sent to her before publication takes place in this column. For lists of state and county officers, see advertising page 6. The Council of the California Medical Association has instructed the editor to allocate one page in every issue for Woman's Auxiliary notes.

Mrs. George Bell read the very interesting and dramatic English play, *Services Rendered* by Somerset Maugham.

Contra Costa County.—The regular meeting of the Woman's Auxiliary to the Contra Costa Medical Association met at the home of Mrs. C. R. Blake. Reports on revision of the constitution were given by Mrs. W. Lucas.

A review of the book *100,000,000 Guinea Pigs* by Arthur Kallet and F. J. Schlink was given by Mrs. H. L. Carpenter.

Election of officers resulted as follows: President, Mrs. M. L. Fernandez of Pinole; first vice-president, Mrs. Kalso Dailey of Richmond; second vice-president, Mrs. M. C. Bolander of Danville; and secretary-treasurer, Mrs. S. N. Weil.

Bridge was enjoyed at the close of the meeting. Refreshments were served by the hostess. Installation will be held January 9, 1934.

LILLIAN M. BLAKE.

Los Angeles County.—The regular meeting of the Woman's Auxiliary to the Los Angeles County Medical Association was held on Tuesday, November 21, at the Ebell Club Solarium.

After the luncheon the following program was given:

Book Review: *Men Against Death*—Paul de Kruif. Review by Mrs. Richard Bailey; *Current Events*, by Mrs. Shiffbauer, chairman; and *New Developments in X-Ray and Radium*, by Dr. C. R. Dunleavy.

Orange County.—Responding with enthusiasm to the invitation of the Woman's Auxiliary of the Orange County Medical Association, 250 guests gathered at the home of Dr. and Mrs. H. A. Johnson of Anaheim on the afternoon of November 7 for a musicale, tea and fashion review that was put on for the benefit of the medical student scholarship fund.

In the receiving line greeting the guests were Mrs. C. S. O'Toole, president of the auxiliary, and Mrs. F. E. Coulter of Santa Ana, chairman of the Ways and Means Committee.

Special guests of honor for the occasion were Mrs. James Percy of Los Angeles, junior past president of the national auxiliary, and Mrs. Philip Doane of Pasadena, state president-elect. They were introduced by Mrs. O'Toole, and each responded with a brief talk in which they likened the local group to the crowning jewel in the state diadem.

Guest artists for the musicale were: Robert L. Brown, baritone, who was accompanied by Miss Ruth Armstrong; Margaret Gaebel Fletcher, reader; and Clarence Gustlin, pianist. The fashion show presented showed the latest trend in styles at the present time.

Following the program the members and guests gathered around the tea tables for a social hour.

Riverside County.—Women of the auxiliary to the Riverside County Medical Society held their monthly meeting Monday evening at the Community Hospital. Hostesses for the evening were: Mrs. C. Van Zwahlenburg, Mrs. B. E. Garrison, and Mrs. R. M. Smith.

Dr. Bon O. Adams was the speaker for the evening, taking as his subject *Quacks and Quackery*. Mrs. A. W. Walker, president, presided at the meeting, which was attended by about twenty women. Refreshments were served by the hostesses at the close of the program.

Sacramento County.—The regular meeting of the Woman's Auxiliary to the Sacramento Society for Medical Improvement was held Tuesday evening, November 16, 1933, at the home of Mrs. Burt Howard, 1224 Fortieth Street.

A short business meeting was held with the president, Mrs. Scatena, presiding. Nominations for officers

for 1934 were made, to be voted on at the next meeting. A contribution was voted to be made to the Braille system for the blind, which is carried on by contributions made to the *Readers' Digest*. Two new members were present and introduced: Mrs. Charles Vanina and Mrs. Anthony Boscoe, both of Sacramento.

In honor of our state president, Mrs. A. H. Hendersen, community singing was enjoyed and taken part in by all. The Misses Jean and Bonnie Briar accompanied and also led the singing. After the singing the Misses Briar entertained with musical selections.

Mrs. Orrin Cook gave a travelogue, which was extremely interesting and much enjoyed.

After completion of the business meeting and program, Mrs. Howard, assisted by Mesdames E. T. Rulison, Charles Von Geldern, Clarence Bittner, George Foster, and E. Sevier, served refreshments.

Mrs. FRANK P. BRENDLE,
Corresponding Secretary.

Santa Barbara County.—The Woman's Auxiliary to the Santa Barbara County Medical Society met at the home of Mrs. John Van Paing, 1334 Alameda Padre Serra, Friday afternoon at 3 o'clock, November 24. The meeting was called to order by the president, Mrs. Van Paing.

The following names for 1934 officers were presented by the Nominating Committee (comprised of Mrs. Charles Stevens, Mrs. H. J. Profant, and Mrs. A. Q. Spaulding): President, Mrs. John Van Paing; vice-president, Mrs. Horace Pierce; secretary, Mrs. W. Remfry Hunt; and treasurer, Mrs. Alfred B. Wilcox.

Since afternoon meetings apparently have been preferred to the customary Monday night meetings, Mrs. Van Paing asked for an expression of opinion for our future policy regarding these meetings. Mrs. Wilcox moved to have the meeting take place in the afternoon. Mrs. Pierce seconded the motion. Carried.

Some time was given to discussion of a plan by which members, in alphabetical order, could be asked to lend their homes for meetings. Mrs. Mellinger suggested that the hostess be relieved of the refreshment problem, this to be arranged by a special committee. The plan appeared to meet with general approval.

Some work was done in tying and binding quilts for the Red Cross.

Those present were favored by an extremely lucid talk by Dr. Ina M. Richter on *The Heart Child*, with emphasis on classification according to type of heart disease and its prognosis.

Tea was served, Mrs. Mark Thaler and Mrs. Lamb presiding at the tea and coffee urns.

MABEL HUNT, Secretary.

NEVADA STATE MEDICAL ASSOCIATION

D. A. SMITH, Mina	President
E. E. HAMER, Carson City	President-Elect
J. N. VAN METER, Las Vegas	First Vice-President
W. H. FROLICH, East Ely	Second Vice-President
HORACE J. BROWN, Reno	Secretary-Treasurer

COMPONENT COUNTY MEDICAL SOCIETIES CLARK COUNTY

The Clark County Medical Society met at the Sagio Hotel, Las Vegas, at 8 p. m. on December 12, 1933.

Dr. John M. Flude, field representative of the American Society for the Control of Cancer, presented the plans that organization has perfected and hopes to introduce into the Nevada State Society.

Dr. Norman J. Kilbourne of Los Angeles then read a paper entitled *Comparison of Operative and Injection Treatment of Hemorrhoids*—a review of sixty-two thousand cases, with lantern slides illustrating various conditions and operative technique.

New officers elected for the ensuing year were: President, Dr. J. N. Van Meter; vice-president, Dr. R. D. Balcom; and secretary, Dr. C. W. Woodbury.
J. N. VAN METER, Secretary.

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WASHOE COUNTY

The annual meeting of the Washoe County Medical Society was held in the banquet room of the Hotel Riverside, Reno, Tuesday at 8 p. m. on December 12, 1933.

A heavy downpour of rain, such as is seldom witnessed, prevented many from coming out; however, the members gathered for the sake of a fraternal get-together meeting. There was no set program. There was a very happy feeling existing and a social fellowship enjoyed, feeling that there was a relief from any restraint which might otherwise mar the pleasure of the occasion.

Thirty-three active busy practitioners of medicine, surgery, radiology, bacteriology, and pathology decided that they would bid Old Man Gloom and his partner, Old Doc Lugubrious Blue, the air and told them very emphatically, in words and song and libations, that they were through with the pair, and for them not to come again.

In common with all practitioners the country over, the medical man has done more than his share of work for the distressed poor. The Government seems to have all kinds of relief agencies with the heads of the departments well paid; but even so, the humble disciples of Esculapius have never turned a deaf ear to the appeals of the poor. Thus they have sustained all over this broad land the noble principles of our profession, similar to Cincinnatus, the old Roman, whose emblem was the plough and the altar, ready for service or sacrifice. It may be true that occasionally some exceptional man who calls himself a physician may have entered the profession solely for the purpose of a gainful occupation, but we feel satisfied that, with over 150,000 physicians today in the United States, the preponderating majority of these earnest men and women are laboring in a true and better cause, and that for the betterment of humanity. As our little band of Reno physicians and those of our confrères from neighboring towns gathered about the festive board, there were no indications of bickerings or jealousy; all formalities were dropped. In our district all know one another by their given names.

With this happy feeling prevailing, the annual report of the secretary-treasurer was read and approved by the president and the censors.

The election of officers resulted as follows: President, Dr. H. A. Paradis; vice-president, Dr. George H. Smith, superintendent of the Nevada Mental Hospital; secretary-treasurer, Dr. Thomas W. Bath, re-elected the seventh year in succession; censor, Dr. Frank L. Samuels.

Votes of good wishes were signified by the society for Doctors Horace J. Brown and M. A. Robison, both of whom were recovering from serious illnesses. There being no further business, the society adjourned.

THOMAS W. BATH, Secretary.

Nutrition and Food Elements.—Within the past few years the attention of the general public has been focused upon food and foodstuffs and nutrition in general to a remarkable degree. Many persons bearing the self-conferred designation of "Nutritionist," with limited knowledge of the subject, have been urging upon the public the inclusion or exclusion of various important articles of diet. Many of these food faddists have a sincere conviction that it is their duty to save mankind from himself as relates to the ills produced by improper diet and other evils. Others, with a more mercenary interest, are offering for sale some articles alleged to contain the food elements necessary for the proper maintenance of health. Most of these persons, many of whom are sincere but misguided, seem to have a one-sided viewpoint of the broad question of nutrition and food.—Surgeon General H. S. Cumming.

MISCELLANY

Under this department are ordinarily grouped: News; Medical Economics; Correspondence; Twenty-five Years Ago column; Department of Public Health; California Board of Medical Examiners; and other columns as occasion may warrant. Items for the News column must be furnished by the fifteenth of the preceding month. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Coming Meetings.

American Medical Association, Cleveland, Ohio, June 11 to 15, 1934. Olin West, M. D., Secretary, 535 North Dearborn Street, Chicago, Illinois.

California Medical Association, Riverside, April 30 to May 3, 1934. Emma W. Pope, M. D., Secretary, 2004 Four Fifty Sutter, San Francisco.

California-Nevada Section of American College of Surgeons, Los Angeles, March 12 and 13, 1934. Detailed announcements will appear in February issue.

Clinical Congress of the American College of Surgeons, Boston, October, 15 to 19, 1934. Franklin H. Martin, M. D., Director General, 40 East Erie Street, Chicago, Illinois.

Medical Broadcasts.*

American Medical Association Health Talks.—The American Medical Association broadcasts each Monday afternoon from 1:30 to 1:45 Eastern Standard Time (12:30, Central Standard Time), over Station WBBM (770 kilocycles, or 389.4 meters).

There is also a fifteen-minute talk, sponsored by the Association, on Saturday mornings from 9:45 to 10 o'clock, Central Standard Time, over Station WBBM.

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San Francisco County Medical Society.—The San Francisco County Medical Society broadcast program for the month of January is as follows:

Tuesday, January 2—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: The Care and Treatment of Crossed Eyes.

Tuesday, January 9—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: The Romance of Vaccination.

Tuesday, January 16—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: Some High Spots in Fifty Years of Medical Progress.

Tuesday, January 23—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: The Unseen World.

Tuesday, January 30—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: The International Control of Disease.

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Los Angeles County Medical Association.—The radio broadcast program for the Los Angeles County Medical Association for the month of January is as follows:

Tuesday, January 2—KECA, 11:15 a. m. Subject: Health Talk.

Friday, January 5—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, January 6—KFI, 9:15 a. m. Subject: Health Talk.

Tuesday, January 9—KECA, 11:15 a. m. Subject: Health Talk.

Friday, January 12—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, January 13—KFI, 9:15 a. m. Subject: Health Talk.

Tuesday, January 16—KECA, 11:15 a. m. Subject: Health Talk.

Friday, January 19—KFAC, 9:15 a. m. Subject: Your Doctor and You.

* County societies giving medical broadcasts are requested to send information as soon as arranged (giving station, day, date and hour, and subject) to CALIFORNIA AND WESTERN MEDICINE, 450 Sutter Street, San Francisco, for inclusion in this column.

Saturday, January 20—KFI, 9:15 a. m. Subject: Health Talk.

Tuesday, January 23—KECA, 11:15 a. m. Subject: Health Talk.

Friday, January 26—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, January 27—KFI, 9:15 a. m. Subject: Health Talk.

Tuesday, January 30—KECA, 11:15 a. m. Subject: Health Talk.

Fifth Pan-American Medical Association Meeting a Floating Congress.—At a meeting of the officers and trustees of the Pan-American Medical Association, convened by Dr. John Oliver MacReynolds on December 6, 1933, in Dallas, Texas, it was resolved to hold the fifth congress of the association in the month of March at the city of Caracas, Venezuela.

The congress will be divided into two parts: the first part, a floating congress, sailing from New York on the United States liner *Pennsylvania*, with a capacity for six hundred passengers, and the second part, scientific and social meetings convened at Caracas, Venezuela. Papers will be presented and discussed both on board and in Venezuela. The official languages of the association are Spanish, French, Portuguese, and English. The cost of the entire trip will be \$195 up; and the time, from March 14 to March 30.

Itinerary of steamship *Pennsylvania* cruise:

Wednesday, March 14—Sail from New York at 12 noon.

Saturday, March 17—Arrive at Havana at 8 a. m. Leave Havana at 10 p. m.

Tuesday, March 20—Arrive at Colon at 7 a. m. Leave Colon at 8 p. m.

Wednesday, March 21—Arrive at Cartagena at 12 noon. Leave Cartagena at 5 p. m.

Friday, March 23—Arrive at La Guaira at 6 a. m., and train or motor to Caracas.

Saturday, March 24—Leave Caracas at 10 a. m., motor to Maracay and then to Puerto Cabello. Leave Puerto Cabello at 5 p. m.

Monday, March 26—Arrive at San Juan at 6 a. m. Leave San Juan at 5 p. m.

Friday, March 30—Arrive at New York at 7 a. m.

This congress affords an excellent opportunity to visit the Latin-American countries and to meet the leading medical men of the twenty-two countries making up the Western Hemisphere. One can well profit by hearing them speak before the various sections, which will all be well represented.

The congress is sponsored by the Venezuelan Government. The visiting doctors will be very hospitably treated and they will be afforded an opportunity of visiting the countries included in the cruise in a more intimate manner than is ordinarily accomplished. The chartering of the Atlantic liner steamship *Pennsylvania* has reduced the cost of the cruise to a very low price. The congress and cruise is open to members and families of the San Francisco and Los Angeles chapters of the Pan-American Medical Association, to the medical men of California in good standing, and to a limited number of sponsored lay friends. Any physician interested in attending this congress can receive additional information by communicating with Dr. Charles P. Mathé, 450 Sutter Street, San Francisco.

Fifty-Second Course of Popular Medical Lectures Given by Stanford University School of Medicine.—The Stanford University School of Medicine announces the fifty-second course of popular medical lectures



View of the new Acute Unit of the Los Angeles County General Hospital. See also editorial comment on page 58. (The maternity wards, on the eighth floor, were installed on December 12, 1933.)

(illustrated) to be given at Lane Hall on alternate Friday evenings at 8 p. m. sharp. The following program has been scheduled:

January 12—The Organization of Medical and Surgical Emergencies in San Francisco, Edmund Butler, M. D.

January 26—Medicine in Community Service, President Ray Lyman Wilbur.

February 9—Relation of Diet to Health, Agnes Fay Morgan, Ph. D.

February 23—Occupational Therapy, Mary C. Rixford, O. T. Reg.

March 9—The Role of Psychiatry in Preventive Medicine, George S. Johnson, M. D.

March 23—Some Contributions of Medical Science to Our Knowledge of Pain, Joseph C. Hinsey, Ph. D.

City Maternity Service at Los Angeles Transferred to County.—For several months there has been a considerable discussion in the Los Angeles County press regarding an out-patient maternity service, which for some years has been maintained as one of the activities of the Health Department of the City of Los Angeles. In these strenuous financial times the city of Los Angeles having felt itself unable to maintain this activity, has sought to have the county of Los Angeles assume the financial burden therefor. Pertinent thereto are the excerpts below from the daily press of December 21, 1933, detailing the final decision thereon:

"Maternity service for needy mothers, hitherto provided through the city health department, recently became a county charge.

"The Board of Supervisors appropriated \$1,700 to carry the extra case load at the General Hospital for the next sixty days, and announced arrangements were being made to provide prenatal and postnatal care for women eligible under county aid requirements.

"Actual hospital care at the time of delivery will be available to all indigent mothers, the requirements as to residence and other details being followed only in the case of treatment given outside the hospital.

"The headquarters at 225 North Main Street will be kept open until final arrangements are made to install a new system of handling the work.

"It is not planned that the present medical and nursing staff of the maternity service will be retained in county work, but additional doctors and nurses will probably be employed through the General Hospital to do the extra work given the hospital through the anticipated influx of maternity cases.

"Because the maternity wards in the new General Hospital unit are already nearly filled to capacity, it will be necessary to send overflow cases to contract hospitals where the county will pay the costs.

"The social service and welfare departments of the county organization will assist in checking on applicants and determining their need, it was announced.

"As a group, and individually, the County Supervisors declared that they were anxious to keep the maternity service functioning and that everything possible would be done to assure adequate aid for expectant mothers who need help."

Nineteen Thirty-Four Herzstein Lecturer Is Dr. Herbert M. Evans.—Dr. Herbert M. Evans, professor of anatomy in the University of California, will give the fourth course of the Morris Herzstein lectures.

The lectures, under the provisions of the will of the late Dr. Morris Herzstein of San Francisco, are held under the auspices of the two universities, and this year will be given at the San Francisco County Medical Society, 2180 Washington Street, January 29, 31, and February 2, at 8:15 p. m.

Doctor Evans, who is also Morris Herzstein professor of biology and director of the Institute of Experimental Biology in the University of California, will speak on "The Internal Secretions of the Anterior Lobe of the Pituitary Gland," illustrating his lectures with slides and charts. The lectures are open to the general public as well as to the medical profession, states Dean Porter, and practitioners, medical students, and the lay public are cordially invited to attend.

Under the terms of his will, Doctor Herzstein left a bequest of \$20,000 to the two universities for the purpose of presenting annual lectures by outstanding authorities in medical science from all parts of the world. The first series of Herzstein lectures were given by Dr. L. A. Orbelli, professor of physiology at the Medical Institute of Leningrad; the second, by Dr. Charles Singer, lecturer in the history of medicine, University of London; and the third series by Dr. Philip Anderson Scaffer, professor of biological chemistry, Washington University School of Medicine, St. Louis.

Radiological Cancer Conference.—The Section on Radiology, in joint meeting with the Los Angeles County Medical Association, is conducting a diagnostic conference at the Elks Club in Los Angeles on

Wednesday, January 24. The conference will begin at 2 p. m. and continue throughout the afternoon and evening, with a two-hour intermission at 5:30 p. m. for dinner, which will be served at the club.

The plan of procedure at this conference will be similar to the one conducted at the Del Monte meeting last spring. Each participant will present one or two case histories, paying special attention to the patient's complaint, physical findings, laboratory data, and x-ray films. As soon as this has been done, each member will write out an unsigned diagnosis. The discussion then continues with biopsy, operative, or autopsy findings, and the "straw vote diagnosis" is checked against the final diagnosis. One session will be devoted to the general aspects of radiological diagnostic procedures, while the other will be centered on the problems involved in abdominal conditions.

The meeting is open to all members of the profession.

The following men will present cases for discussion: Doctors Lowell S. Goin, Henry Snure, Kenneth Davis, Lyell C. Kinney, John W. Crossan, Ray Taylor, C. W. McClanahan, Milton Geymann, and Karl Bonoff.

California One of Great Centers for Tropical Medicine.—California, and particularly San Francisco, is looked upon as one of the three great centers for the study of tropical diseases in the United States, ranking with New York, and New Orleans.

This fact was learned recently in a communication from Dr. A. C. Reed, director of the University of California Institute of Tropical Medicine, who is en route from New York to San Francisco, after attending a number of medical meetings and visiting southern and eastern universities where tropical medicine is important.

In Richmond, Virginia, he attended the joint meeting of the American Society of Tropical Medicine and the Southern Medical Association. He read two papers on amebiasis and its treatment, and one paper written by Doctors Anderson and Wagner of the University of California staff on a new approach to the treatment of leprosy. Doctor Reed was also reelected a councilor of the American Society of Tropical Medicine.

Following this meeting, November 15 to 18, 1933, Doctor Reed visited Columbia and Cornell universities, to inspect tropical medicine research, and then went to Chicago at the invitation of Dr. Herbert Bundesen, president of the board of health, to consult on an epidemic of amebic dysentery in that city.

San Francisco Heart Committee.—The Heart Committee of the San Francisco County Medical Society held its fourth annual postgraduate symposium on heart disease November 22 and 23, 1933, in half-day sessions at the San Francisco, Stanford University and University of California Hospitals, and at the Department of Public Health. The program was arranged by Doctors William Dock, Jacques Gray, William J. Kerr and J. Marion Read, assisted by the Committee on Education and Publicity, of which Dr. John P. Strickler is chairman. There was a total attendance of 665, and fifty-five cities of California were represented. The following subjects were discussed:

Physiologic and Anatomic Backgrounds in Arterial Tension. By J. Marion Read, M. D.

Essential Hypertension. By Carol McKenney, M. D.

Therapy of Arterial Hypertension. By Edwin L. Bruck, M. D.

X-Ray Demonstration of Calcified Heart Valves, and Diagnosis of Valvular Heart Disease by X-Ray. By L. Henry Garland, M. D.

Demonstration of Heart Preparations. By Leonard W. Buck, M. D., and Jesse L. Carr, M. D.

Presentation of Cases of Hypertension. By Raymond J. Reitzel, M. D.

Restoration and Normal Mechanism in Auricular Fibrillation. By Garnett Cheney, M. D.

Effort as a Precipitating Factor of Acute Coronary Occlusion. By William W. Newman, M. D.

Management of the Decompensated Cardiac. By Arthur Bloomfield, M. D.

Clinical Features of Heart-Block. By J. K. Lewis, M. D.

Circulatory Failure from Infections or Operations. By William Dock, M. D.

Clinic on Congenital Heart Disease. By Amos Christie, M. D.

Symptomatic Interrelations of Heart and Abdomen, with Demonstration of Patients. By Eugene S. Kilgore, M. D.

Clinic on Types of Murmurs and Their Significance, with Stethophone Demonstration. By William J. Kerr, M. D.

Problem of Heart Disease in the City and County of San Francisco. By J. C. Geiger, M. D.

Problems Relating to the Cardiac School Child. By John J. Sampson, M. D.

Notes on the Cardiac Morbidity Survey in San Francisco. By Jacques P. Gray, M. D.

Heart Disease a Public Health Problem. By Walter H. Brown, M. D.

The annual meeting and election of officers of the Heart Committee was held November 23, 1933, at the San Francisco County Medical Society. The newly elected officers of the Heart Committee for 1934 are: Gordon E. Hein, chairman; John J. Sampson, vice-chairman; J. Marion Read, secretary.

Following the business meeting, Dr. Emile F. Holman discussed the present status of cardiac surgery. This was followed by a clinical pathological conference, conducted by Doctors Jesse L. Carr and David A. Wood.

Fair Dates Listed for Year 1934.—Dates of twenty-seven fairs and fiestas to be held in California during 1934 were set at the annual meeting of the Western Fairs Association in San Francisco.

The association elected Edward G. Follman of Stockton its new president; W. Coburn Cook of Turlock vice-president; and Charles W. Paine of Sacramento, secretary.

The 1934 fair and outing schedule, as given by the Los Angeles *Examiner*, follows:

Pasadena Rose Tournament, January 1; National Orange and Horse Show, San Bernardino, February 16-25; Imperial Midwinter Fair, Imperial, March 3-11; Santa Rosa Rose Show, May 14-19; Fiesta de Las Rosas, San Jose, May 23 to June 2; Visalia Rodeo, June 2-3; Livermore Rodeo, June 9-10; Sonoma Rodeo, June 3; San Leandro Cherry Festival, June 4-9; Russian River Fiesta, Healdsburg, June 20-22; World's Largest Outdoor Card Party, Ripon, July 21; California Rodeo and Salinas Big Week, July 27-29; Coronado National Horse Show, July 28 to August 4; Turlock Melon Festival, August 6-11; Santa Barbara County Fair, Santa Maria, August 10-12; Humboldt County Fair, Ferndale, tentatively set for second week in August; San Mateo Horse show, August 11-13; San Joaquin County Fair, Stockton, August 20-26; San Leandro Dahlia Show, August 21-26; San Benito County Horse Show, Bolanda Park, August 24-26; Old Spanish Days Fiesta, Santa Barbara, August 23-25; California State Fair, Sacramento, September 1-10; Merced Roundup, September 15-16 (tentative); Tulare County Fair, September 18-22; Shasta County Fair, Anderson, September 20-22; Los Angeles County Fair, Pomona, undecided; Pacific Slope Dairy Show, Oakland, November 5-11.

CORRESPONDENCE

Subject of following letter: A letter to California and Western Medicine from the American Red Cross.

To the Editor:—Thank you so much for the generous contribution of space which was given to the American Red Cross in CALIFORNIA AND WESTERN MEDICINE. In thus aiding us in extending a universal invitation to participate in Red Cross work through individual membership, you made a most substantial contribution to our membership roll call.

Please allow me to express to CALIFORNIA AND WESTERN MEDICINE, in behalf of our national officers and leaders of our 3,700 Red Cross chapters, sincere appreciation for your generous cooperation.

Cordially yours,

DOUGLAS GRIESEMER,
Director of Roll Call.

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Vol. VII, No. 12, January, 1909

From Some Editorial Notes:

Volume Seven.—And here beginneth the seventh volume of *your journal*; and, incidentally, about this time there also beginneth another session of the legislature. But more of that anon. Let us, for a moment, think only of pleasant things. The journal was born out of the chaos of a reorganization of the state society into a very troublous world. After a breathless—though bloodless—conflict of some years, the angel of peace seemed about to hover over the abiding place of the journal, when lo! on a sudden it all went up in smoke together with several other pieces of personal property in San Francisco. Then the strenuous life was resumed. . . .

Our Law.—We may truthfully refer to the law regulating the practice of medicine as "our law" for two reasons. It not only regulates the manner in which physicians may gain permission to practice in California, but it had its very origin with the members of our profession. . . . Because the better class of physicians have everywhere recognized their full duty to the people, they have striven to secure the enactment of proper medical laws which will and do, in large measure, prevent unscrupulous and unqualified doctors from practicing their partly gained profession and preying upon the public. The better element in the medical profession in this state secured the passage of the law of 1876, and for a quarter of a century fought to retain it. The same sort of movement occurred when the law of 1901 was secured, and again with that of 1907; it was and is the fight of the upright and honest members of our own profession to secure adequate protection to the public against the small, dishonest element which, for its own base purposes, desires to extend little or no protection to the ignorant sick. And so it has been in every State in the Union. . . .

Sane Views.—So much awful piffle has been written on the "sexual life" and the "sexual question" and the so-called "social evil" (as though there were but one only social evil!) that it is distinctly refreshing to find an author expressing views that are based on plain, ordinary common sense. . . .

Small Places Do Great Things.—It is not always the large community that sets the example in doing things. Elsewhere is the report of a meeting of the Placer County Society in which is given a résumé of the work of stamping out malaria in Auburn. It is a sermon in a very few words and one which we should take to heart. . . .

Pacific Association of Railway Surgeons—Excerpt from Official Minutes.—The Pacific Association of Railway Surgeons first effected a permanent organization in Santa Barbara, California, on April 21, 1903. The State Medical Society was holding its convention at the time, and as many of its members were railway surgeons they deemed it an opportune time to form an association of railway surgeons. . . .

The sixth annual meeting of the Pacific Association of Railway Surgeons was held in San Francisco, August 28 and 29. Meeting called to order by the president, Dr. J. R. Colburn, at 2:15 p. m. . . .

* This column strives to mirror the work and aims of colleagues who bore the brunt of society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and new members.

(Continued in Advertising Section, Page 14)

BOARD OF MEDICAL EXAMINERS OF THE STATE OF CALIFORNIA*

By CHARLES B. PINKHAM, M. D.
Secretary-Treasurer

News Items, January, 1934

Revival of an old-time narcotic racket, with licensed physicians as victims, was revealed by the recent arrest of Clarence Donley (Clarence Donnelly, alias Clarence Doole), asserted addict, found in possession of what purported to be a permit issued under the State Poison Law authorizing doctors to give him prescriptions for narcotics. Also found in his possession were one hundred and thirty \$1 bills, which indicated the possibility that he was engaged in peddling. Investigation revealed that several prominent doctors of Pasadena and Long Beach had violated both the state and federal narcotic regulations by prescribing for this addict, there being no such thing as a permit authorizing any physician to prescribe narcotics for an addict, unless after examination he has been found to be suffering from some pathology which warrants his use of said narcotics.

The "hospital association" racket is daily becoming more burdensome to the Board of Medical Examiners. Contracts are being sold throughout the state, the holders thereof in many instances complaining that they cannot obtain the promised professional service for which they paid. There is no state or municipal agency that has jurisdiction over the "fly by night" so-called "hospital associations," and regulatory legislation is sadly needed as a protection against the petty larceny methods of some of those engaged in this racket.

According to an editorial in the San Francisco *Wasp-News Letter* of November 25, 1933, the fortune tellers, sorcerers, necromancers, wizards, and other thaumaturgists have decided to ordain themselves as bishops so as to evade alike the "snares" of the State Medical Board and the "peculations" of the Los Angeles tax collector. "In the case of a modern Los Angeles prophet-bishop, or sorcerer-bishop, the clients constitute the flock; the clientele is the diocese. With no strenuous or expressed opposition from client or clientele, the bishop can ordain himself. . . . When a prophet or sorcerer-bishop hangs out his shingle in the City of the Angels, he is entitled to all the benefits of clergy which locally his episcopal rank entails, including missionary rates on railways and steamships, and so forth—and to be especially exempt from attack or persecution at the hands of the medical profession. Therefore, we commend, for what it may be worth, to our sorcerers, fortune tellers, and other similar operators in the San Francisco Bay region, the plan of transforming themselves into bishops which has been so felicitously adopted by their colleagues, the miracle workers of Los Angeles."

Commenting on the number of medical school graduates who pass the examination for a license to practice in this state as compared with the large number of failures at the bar examination, Chester H. Rowell, in the San Francisco *Chronicle* of November 15, 1933, makes a comparative statement as to the educational demands for admission to an examination for a license to practice medicine and the far inferior educational standard required of those seeking a license to practice law. This, Mr. Rowell states, accounts for the difference in examination results between applicants seeking the right to practice the respective professions mentioned.

* The office addresses of the California State Board of Medical Examiners are printed in the roster on advertising page 6.

(Continued in Advertising Section, Page 17)